American Gas Association MONTHLY

July-August 1942

VOLUME XXIV NUMBER 7

When Bombs Strike . . . .

. . . . WILL YOUR COMPANY BE PREPARED?

"WAR PROTECTION OF THE GAS INDUSTRY"

gives you war-tested information on how to maintain gas service under fire

● Here is a book, full of fundamental information, which tells you what to do and—NOW—to prepare your plant and other facilities against enemy attack. It also outlines procedures to repair damages resulting from actual attack. It includes extensive data on war protection collected since 1935 and filed by the American Gas Association for the use of member companies.

● This essential publication is issued under the auspices of the Committee on War Activities with the assistance and approval of committees of the various sections. The background includes the published literature of American, English, German, and other foreign sources, communications from observers on the scene, and the latest experimental work carried out by American gas companies to determine suitable procedures for American conditions.

● "War Protection of the Gas Industry" is issued in loose-leaf form so that it can be readily kept up-to-date. The material issued thus far forms 100 pages, 8½" x 11" in size, with 46 photographs and line drawings. Additional information is being printed and will be available in a few weeks. The modest first cost of the manual includes all subsequent and revised material.

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Long before we were in the war the American Gas Association formed its Committee on War Activities. This committee has been most active and effective in the preparation and completion of material pertinent to "War Protection of the Gas Industry," which is the title of a valuable book published by the American Gas Association in March 1942. It is an authoritative text book on the subject. . . . . As makers of a product long identified with the Gas Industry, we extend our congratulations to the American Gas Association,

. . . . **CAST IRON PIPE RESEARCH ASSOCIATION**

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American Gas Association MONTHLY

CONTENTS FOR JULY-AUGUST 1942

Among the more level-headed men in our industry who are looking beyond the turmoil and terrors of war to the days of peace is H. P. Nagel whose poignant remarks about post-war planning lead this summer issue. With a touch of humor when mentioning the "vice-presidents-in-charge-of-thinking-about-tomorrow," he puts his finger on some vital facts that don't require any crystal gazing to evaluate. . . . Of special significance in this issue is the report of the A. G. A. Laboratories on gas burner research. It shows that the war has not entirely diverted our attention from the need for this type of research even though appliances may be temporarily unavailable. . . . The third in our series of articles on Home Service in the War further substantiates the belief that this branch of the industry is doing a bang-up job on the nutrition front. This time the Mid-Western companies report their activities. . . . The Motor Vehicle Committee has contributed another useful and timely report designed to "keep 'em rolling," or at least in rolling condition. Its practical recommendations for servicing stored vehicles were prepared by experts of long experience. . . . Our next issue will be out September 1.

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Construction of the gas pipeline crossing Lake Pontchartrain which is said to be the world's longest underwater line. Photographed by L. F. Van Houten, editor, *United Gas Log,* this picture shows workmen lining up pipe in the welding clamps approximately 12 miles from shore.

American Gas Association MONTHLY

JAMES M. BEALL, *Editor*

Management's Secret Weapon

By H. P. NAGEL

Dominion Natural Gas Co., Ltd., Buffalo, N. Y.

THE present is pregnant with the future and unless our D Day plans match our V Day plans we may win the war and lose the peace!

M Day or Mobilization Day has come and gone. Its plans are in operation and depending upon the correctness of those plans, the vigorous and wholehearted execution of those plans, our V Day or Victory Day will be hurried or delayed.

Today, companies, organizations, associations, industries and governments are looking beyond V Day to D Day or Demobilization Day. All progressive and forward-looking people know that we must win the peace in the light of those things we are fighting for as well as win the war, or else we fight in vain.

•

None has stated it better than Brigadier-General H. F. McDonald, Chairman of the General Advisory Committee on Demobilization and Rehabilitation in an address before the Montreal Rotary Club when he said:

"The problems of post-war planning are an integral part or should be an integral part of war planning—Men and women will fight better; will work harder; will sacrifice more, and do all this more cheerfully, if they feel that behind the regimentation and ordering which must necessarily accompany a great war effort, there is a vision for the future, and practical planning to implement that vision."

This is no starry-eyed vision! Anyone who has done any research on this subject cannot be but impressed by the far-reaching plans and programs for our post-war era which organizations of all types are making right now.

Have you heard of the V.P.I.C.O.T.A.T.? This started out as an advertising promotion by the Koppers Company to encourage planning for peace time when the present seller's market became a buyer's market. Today there are many flesh and blood "thinkers for the future" or as they are tagged, Vice-Presidents-in-charge-of-thinking-about-tomorrow. And this type of thinking is fast becoming a preparedness policy being adopted by industry and business today as an insurance against the problems of peace-time economy.

You no doubt have read the recent newspaper clipping stating that the "holiday" in car production had given the automobile manufacturers something they long have lacked; namely, a time to plan for a future model—this planning is going forward despite the demands of the war production effort. Furthermore, it stated that it seems a safe assumption that a widespread survey of customer ideas will be undertaken before heavy volume output of any type vehicle is projected.

These two cases cited will illustrate the two ideas pregnant with far-reaching results which will bear repetition for our industry at this time.

•

One—Plans for the post-war era or D Day are going forward despite the demands of the war production effort.

Two—A widespread survey of customer ideas will be undertaken before heavy volume output is resumed.

Don't let us fool ourselves—other organizations, including our greatest competitors are already in the field of post-war planning. Surely our research has shown us that various governmental agencies are thinking in terms of tomorrow. Private industry must be aroused to the opportunities and responsibilities made by the return of

* Extract from address before Canadian Gas Association Convention, Montreal, June 4-5, 1942.

peace, or as Professor Malcolm P. McNair of the Harvard Graduate School of Business Administration points out in a recent article:

"If private enterprise remains timid, apathetic, or even passive in its attitude toward the problems to which we must turn our whole attention on V Day, then the government is going to step into the breach . . . there can be only one result, namely, the disappearance of the private enterprise system and the establishment of a so-called managerial society, which is a polite name for a totalitarian state. . . . Business planning must be grass roots planning from the bottom up, it must be planning by private enterprise, planning by industries, etc."

Industry's Objective

A final thought in this connection —Do you know that the most significant fact in today's industrial picture, as revealed by a national survey, is that industry's objective for today is to "stabilize tomorrow's business."

What do these statements have to do with market surveys? Obviously, these problems must be realistically dealt with by "facts" and facts are produced by surveys. As obvious as this may seem, it took Calvin Coolidge to state succinctly that:

"If all the folks would do the few simple things they know they ought to do, most of the big problems would take care of themselves."

Our post-war problems will be tremendous but rather than be a defeat for a stagnant industry, they offer a challenge for a progressive industry.

We will have industrial load dislocations and migration to come, but we can meet these if we are aware of their existence. We need today knowledge blended with wisdom and facts tempered with sympathetic understanding.

We cannot be satisfied with conditions of the moment for there will be changes tomorrow, but if we have a running inventory of the long and short trends, the changes and shifts, or, as one market expert has put it, "a moving picture instead of a still shot" we will know the tides, the currents, the wind, and then ride with them.

In conclusion, I know of no better summary than a forceful statement by William L. Batt, a leading industrialist, head of the SKF industries and now with the War Production Board. He was called as an expert witness on post-war planning before a committee of the House and said:

"It is immensely important that we try . . . to make out at least the type and possible shape of the problems we shall meet face to face in the future. And when we discover that these problems will be many and varied and of tremendous significance to our future well-being, then we must meet the next challenge of duty, which is to undertake immediately the formulation of plans for their solution. This was entirely ignored during the World War, and we have not yet rid ourselves of some of the problems that might have been solved before the war was over, if we had the foresight to do it. In the meantime, a new war has come along that will create changes of far greater importance. The men who are devoting their time and efforts to the solution of our armament problem have no time for worrying about the disarmament problem. If we wait until the end of the war, it will be too late."

"This battle must finally be won by what I have termed 'management's secret weapon' and by that I mean the much more extensive and planned use of facts and figures about its own business, its own industry, and the whole economy in which it operates."

Gas Engine Power Census Completed

G. R. WALTON, Chairman of the Gas Engine Power Committee of the Industrial and Commercial Gas Section, announces that final data as of January 1942 for the annual A. G. A. Gas Engine Power Census has been compiled and soon will be available in printed form. Each year this Census—a study of the gas engine load served by the natural gas companies—is assembled in accordance with a method established by previous committees whereby the engines are rated at 75 pounds B.m.e.p. and 1,000 foot piston speed.

With 49 natural gas companies reporting, at the end of 1942 there were 4,452 gas engine accounts as against 4,234 for 1941—an increase of 5.1%. The number of engines in operation increased 5.2%, rising from 7,905 the previous year to 8,316 in January 1942. Total horsepower grew to 42,567 or 8.6%, from 495,726 to 538,293. It is interesting to note that average horsepower per engine has risen 3.2%. Average annual gas sales per gas engine account were 3,032 MCF. Total annual revenue reported at the beginning of 1942 was nearly $2,795,310, or an average of 3.8% per account.

A number of the newer engine accounts are in war production plants, the committee reports, and it is expected that still more gas-driven power will be used in war production as the war tempo increases. In some sections of the country threatened electric power shortages have resulted in a number of gas engines being installed or ordered for various defense projects. These, it is reported, will be used both as prime movers and for the generation of electricity for plant use.

It appears that the synthetic rubber program may lean on the use of gas engines, and a sizeable number of engines is being contemplated. The many alkylation plants producing high-octane gasoline are prospects for gas engines. An especially large application is found in the light metal plants producing aluminum and magnesium by electrolytic methods.

A. G. A. E. M. Elects New Officers

Col. Rockwell

COLONEL WILLARD F. ROCKWELL, president, Pittsburgh Equitable Meter Company, Pittsburgh, was elected president of the Association of Gas Appliance and Equipment Manufacturers at the annual meeting held in Chicago on June 11. Other officers named at this meeting were: first vice-president—Lyle C. Harvey, president, The Bryant Heater Co., Cleveland; second vice-president—D. P. O'Keefe, O'Keefe and Merritt Co., Los Angeles; and treasurer—John Van Norden, American Meter Co., New York.

The new officers assume their posts on October 1, 1942.

Air Raid Drill . . . *Wins Acclaim of Army and Civilian Defense Officials*

By DONALD M. JOHNSTON
Portland Gas & Coke Co., Portland, Oregon

WHEN the 16-story Public Service building in Portland, Ore., staged the first air raid drill of its kind in the Pacific Northwest and one which was cited as a model for other buildings to follow, Portland Gas & Coke Company as a principal occupant took a prominent part.

The result of weeks of careful planning and study, the event went off without a hitch while representatives of the U. S. Army Engineers protective division and local civilian defense organization watched approvingly. The plan called for the evacuation of 1000 occupants, entirely by stairway, to designated safe areas.

For the same reason that the plan places no reliance on the five elevators because of possible power interruption during an air attack, kerosene lanterns are used to light the stairways and communications with the 9th floor control center are entrusted to foot messengers.

Safe Areas Determined

First step in working out the plan was determination of safe areas in the building, determined by applying known effects of bombing to construction features of the building which is one of the largest and most modern in the city. After allowing a strong safety margin, refuge areas were restricted to the space between the sixth and 12th floors, inclusive.

Floors are organized as units under guidance of floor wardens and their assistants who lead their groups in predetermined order to their designated safe floors. Wardens also are responsible for their groups during their stay in the safe area and this includes keeping up the groups' morale. Responsibility does not end until all have been safely returned after the all clear signal.

Stairways are kept continuously in full use but without crowding or hurrying. Before assembling, occupants of each office open windows to relieve bomb blast concussion, close venetian blinds, turn out all lights and unlock doors.

Eight minutes after the building's air raid warning sounded, occupants of the building had been led to the assigned areas, fire squads on the roof were extinguishing an actual incendiary practice bomb, first aid squads were treating agreeable "patients," and on one floor an accordian had made its appearance in the hands of a morale builder to lead group singing.

Smoothness and precision were objectives rather than speed, although the time of eight minutes was considered exceptionally good considering that no practice of any kind had been held previously. It was a case of putting into action weeks of careful planning and thoughtful study of assignments.

Approximately 200 individuals are included in the building's defense organization, under the direction of J. Ralph Brown. Portland Gas & Coke Company is represented by fifty, including Joseph A. H. Dodd, credit manager, who heads the first aid; Cecil Griffith of the accounting department, communications; C. H. VanHooren of the commercial department, who is assistant to the police warden; and Frederick A. Fisher of the legal counsel is fire chief.

Control center, from which all operations are directed, is located on the ninth floor where heads of the defense organization take their posts to coordinate activities throughout the entire building.

First aid squads report to each occupied floor, as well as to the vacated first floor, with additional teams held in reserve at the control center near which there is a field hospital to handle more serious cases. All teams are Red Cross trained and fully equipped.

Each floor has its guards, working always in pairs, whose duties first are to direct traffic at the stairways and then to remain behind to report fires or other developments.

Heaviest concentration of guards is on the vacated main floor because the building has been designated as a public air raid shelter and incoming traffic must be handled so that it does not conflict with the scheduled procedure for building tenants.

Fire squads report to the roof and first four floors, with a roving squad at the control center for emergency duty. Each squad is equipped with stirrup pump, safety goggles, buckets, crowbars, axes, shovels, gloves, coveralls and flashlights. Supplies of sand and water are spotted on each floor. Special maintenance squads in the basement are charged with maintaining and operating utility services in the building and making emergency repairs where possible.

Well-equipped fire squad going after an "incendiary" on the roof of the 16-story Public Service building in Portland, Oregon

Nominating Committee Reports for 1942-1943

Arthur F. Bridge

To Members of the American Gas Association:

IN compliance with Section 2 of Article II of the by-laws of the American Gas Association, announcement is hereby made to the membership of the following report of the General Nominating Committee which will be presented to the Annual Meeting in the Fall:

For President—Arthur F. Bridge, Vice-President and General Manager, Southern Counties Gas Company, Los Angeles, Calif.

For Vice-President—Ernest R. Acker, President, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

For Treasurer—J. E. Llewellyn, Insurance Manager, The Brooklyn Union Gas Company, Brooklyn, N. Y.

For Directors—two-year terms: John W. Batten, Vice-President and General Manager, Michigan Consolidated Gas Co., Detroit, Mich.

James A. Brown, Engineer in Charge of Gas Operations, Commonwealth & Southern Corp., New York, N. Y.

D. W. Harris, Vice-President and General Manager, Arkansas Louisiana Gas Co., Shreveport, La.

H. N. Mallon, President, Dresser Manufacturing Co., Bradford, Pa.

Hudson W. Reed, Executive Vice-President, The Philadelphia Gas Works Co., Philadelphia, Pa.

W. F. Rockwell, President, Pittsburgh Equitable Meter Co., Pittsburgh, Pa.

Herman Russell, President, Rochester Gas & Electric Corp., Rochester, N. Y.

Marcy L. Sperry, President, Washington Gas Light Co., Washington, D. C.

T. J. Strickler, Vice-President and General Manager, Kansas City Gas Co., Kansas City, Mo.

P. S. Young, Chairman, Executive Committee, Public Service Electric & Gas Co., Newark, N. J.

Ernest R. Acker

J. E. Llewellyn

R. G. Barnett, Vice-President and General Manager, Portland Gas & Coke Co., Portland, Ore.

Respectfully submitted,

General Nominating Committee

PAUL R. TAYLOR, *Chairman*
B. C. ADAMS
R. E. FISHER
CHESTER L. MAY
JAMES L. STONE
ALAN P. TAPPAN

The following have been nominated by Section Nominating Committees to serve as Section officers for the next Association year:

Accounting Section: For Chairman—L. A. Mayo, Connecticut Light & Power Company, Hartford, Connecticut. For Vice-Chairman—O. H. Ritenour, Washington Gas Light Company, Washington, D. C.

Industrial & Commercial Gas Section: For Chairman—B. H. Gardner, Columbia Gas & Electric Corporation, Columbus, Ohio. For Vice-Chairman—Charles G. Young, Springfield Gas Light Co., Springfield, Mass.

L. A. Mayo

B. H. Gardner

John A. Robertshaw

Burt R. Bay

B. A. Seiple

John H. Wolfe

John W. Batten

R. G. Barnett

James A. Brown

D. W. Harris

H. N. Mallon

Hudson W. Reed

Willard F. Rockwell

Herman Russell

Marcy L. Sperry

T. J. Strickler

P. S. Young

Manufacturers' Section: For Chairman—John A. Robertshaw, Robertshaw Thermostat Company, Youngwood, Pa.

Natural Gas Section: For Chairman—Burt R. Bay, Northern Natural Gas Company, Omaha, Nebraska. For Vice-Chairman—R. E. Wertz, Amarillo Gas Company, Amarillo, Texas.

Publicity & Advertising: For Chairman—Charles A. Tattersall, Niagara-Hudson Power Corporation, New York.

Residential Section: For Chairman—B. A. Seiple, Jersey Central Power & Light Company, Asbury Park, N. J. For Vice-Chairman—C. V. Sorenson, Midland Utilities Company, Hammond, Indiana.

Technical Section: For Chairman—John H. Wolfe, Consolidated Gas Electric Light & Power Co., Baltimore, Maryland. For Vice-Chairman—Charles F. Turner, East Ohio Gas Company, Cleveland, Ohio.

"Borderline" Coals May Be Utilized

CERTAIN coals heretofore considered unsuitable for war-time production of coke and its by-products probably can be used for these purposes, it is revealed by comprehensive tests conducted by the Bureau of Mines on the coking properties of coal, Dr. R. R. Sayers, Director of the Bureau, reported June 27.

Tests completed already by James T. McCartney and Joseph D. Davis of the Bureau of Mines indicate that some of the "borderline" coals can be used with comparative safety if proper measures are observed. "Borderline" coals are those whose physical properties are in doubt. Some of these coals may expand when heated and some cause extensive damage to coke ovens.

Several blended coals also were investigated by the technicians and some of these responded favorably to the tests, Dr. Sayers stated.

To simulate actual conditions, the Bureau chemists and physicists heated coal in two types of ovens in the Central Experiment Station at Pittsburgh, Pa. The material was subjected to varied pressures while rate of heating was controlled closely; expansion changes were noted and the finished product was examined thoroughly to determine its value for commercial use.

Expansion of some of the coal samples was so great that retorts used in the experimental ovens were damaged badly. If these coals had been used in commercial ovens, widespread loss would have resulted.

Some coke oven operators, who have accelerated their output chiefly to fill the needs of blast furnaces, are encountering difficulties in obtaining suitable coking coals. Some coking coals yield a coke that is too small in size and fingery to be suitable for use in blast furnaces. Therefore, blends with other coals are used so that a satisfactory coke is obtained, Dr. Sayers explained. If a proper blend is not obtained, dangerous expansion may result and the coke itself may prove unsuitable to the consumer.

A copy of the report regarding the experiments may be obtained by writing the Bureau of Mines, Department of the Interior, Washington, D. C., for Report of Investigations 3644, "Expansion of Coal During Coking," by James T. McCartney and Joseph D. Davis.

Victory Story

AN interesting story is told about the origin of the "V for Victory" campaign which has become a famous symbol of liberty. It seems that the head of the British Broadcasting System had to pass down a street where the London gas company's men had painted big white "V's" in several places to mark the location of important valves during blackouts. He had been wracking his brain for a suitable campaign to carry to the enslaved peoples of occupied Europe and after a few hundred promenades down that street, the "V for Victory" campaign idea hit him like a ton of bricks.

Design Fundamentals . . . *of Atmospheric Gas Burner Ports Presented in A.G.A. Bulletin*

By R. L. FLETCHER

Chairman, Committee on Domestic Gas Research

and

R. M. CONNER

Director, Testing Laboratories, American Gas Association

R. L. Fletcher

ONE of the major research projects being sponsored by the Committee on Domestic Gas Research, assisted by its technical advisory committees of manufacturers and conducted at the American Gas Association Testing Laboratories, is a fundamental study of atmospheric gas burners. This research (Project No. 3, Research in Fundamentals of Atmospheric Gas Burner Design) developed in 1940 from the original research investigation on gas ranges undertaken in 1935 and which has been in progress since that date.

One of the main objectives has been to clarify the many unknown factors presented by usual types of atmospheric gas burners and thus make possible the incorporation of additional refinements and effectiveness in their design. By such means added assurance would be given of improved burner operation and the way pointed to development of new types of burners and new principles of gas utilization.

This investigation has been conducted concurrently with other domestic gas research projects now in progress at the Laboratories, under the same committee sponsorship. They involve research on domestic gas ranges (Project No. 1), gas water heating (Project No. 2), direct gas space heating (Project No. 5), and central gas space heating (Project No. 6).

Summarizing extensive studies and experimental work conducted over the past 2 years, on one phase of this subject, Bulletin No. 13, "Fundamentals of Design of Atmospheric Gas Burner Ports," has recently been completed and will soon be available for distribution.

R. M. Conner

As its title suggests, it deals with a specialized study of that part of the burner through which the gas-air mixture issues and with which the base of the flame is in contact, namely, the burner port. It makes available new scientific information on the interrelationship of port design variables such as spacing, size, depth, number of rows, port form, and height and diameter of port section, as well as their influence on burning characteristics and flame heights of 3 widely different types of fuel gases. It supplements more general information presented in Bulletin No. 10, "Research in Fundamentals of Atmospheric Gas Burner Design," published in March, 1940. Special attention was given in this study to larger burners such as those employed in central and space heating gas appliances, as well as smaller types used on domestic gas ranges and water heaters.

The new bulletin presents numerous tabulations, graphs, and illustrations showing:

1. Effects of port size on lifting and yellow tip limits for natural, manufactured, and butane gases.
2. Variations in lifting limits with port size and gas rate.
3. Effects of port depth, port spacing and number of rows of ports on lifting and yellow tip limits for natural gas.
4. Variations of flash back limits with various port depths on manufactured gas.
5. Effects of height and diameter of raised port sections on lifting and yellow tip limits.

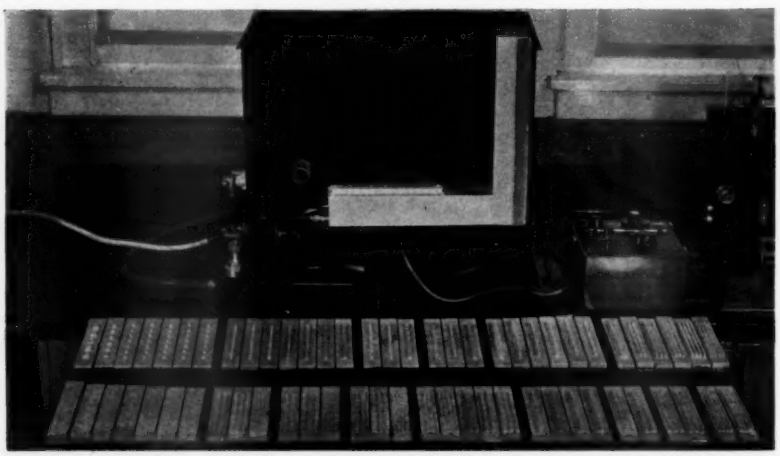


Fig. 1—Illustrating burner and heater construction (background), and burner-head plates used for determining effect of number, size, depth and spacing of ports, number of rows of ports, depth of ports, raised and plain ports on burner operating characteristics

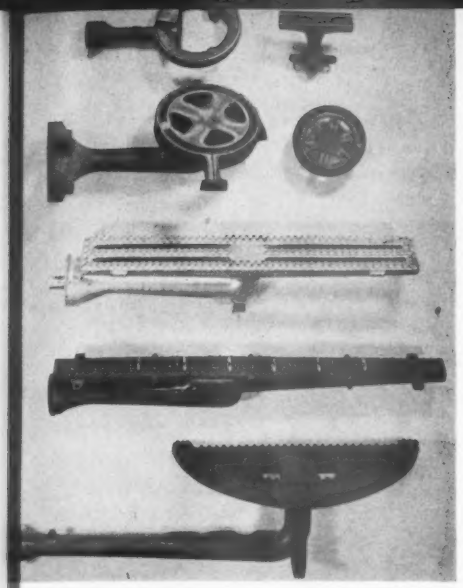


Fig. 2—Contemporary burners with different port construction used to check results on experimental test burner. Two burners at top have slotted ports, next two below, ribbon ports and three at bottom, drilled ports

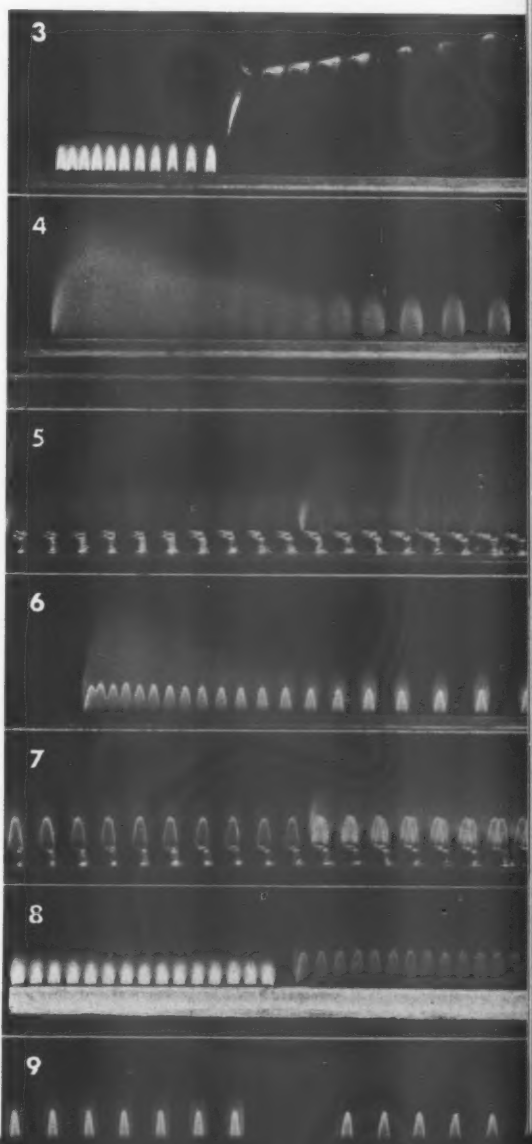
6. Relation of inner cone heights to primary air on 3 different gases.
7. Height of outer flame mantle.

In addition to these data, several new and unexpected developments resulted from this study. As is frequently the case when a problem is approached in a scientific manner, it is believed that they are probably of greater value than the detailed data obtained. They include the following:

1. Three mathematical formulae were developed. One made possible the calculation of lifting limits with any usual burner port size, depth, and spacing. The others permitted (1) the calculation of the inner cone height and (2) the outer mantle flame height, from burner port design data readily available.
2. Flow of gas-air mixture through burner ports seldom followed the long-used formula for flow of gas through orifices, $q = 1658.5\ KA\frac{P}{d}$ but rather a modification of this equation, $q = 1658.5\ K\left(\frac{P}{d}\right)^n$. Coefficients of burner port discharge were found to be usually higher than previously reported values.
3. Burner characteristics were not noticeably improved by use of raised ports as compared with flat ports provided the same depth was maintained.
4. New curves on burner head pressures vs. port size, primary air, and gas rate were developed.

It will be readily apparent from a review of this new bulletin that important steps have been taken toward replacing "rule of thumb" methods in burner and gas appliance design with exact scientific information. With the modern trend toward an increased number of special applications and reduction in over-all size of appliances, such data are of great practical value. They permit more exact design of burner ports, particularly with respect to combustion space requirements. It is proposed to point out and discuss briefly some of the many interesting results which have been developed.

For the major portion of this investigation, a typical burner such as generally employed in space heaters and central heating equipment was employed. It was so modified that interchangeable burner head plates embodying a wide range of port sizes, port spacings, port depths, number of rows, and other port variables could be readily bolted in place. Port sizes employed ranged from No. 60 D.M.S. to ½ inch in diameter and port depths varied from No. 18 gage to ¾ inch. Raised port section diameters ranged from 5/32 to ⅜ inch, raised port section heights from zero to ½ inch, and port spacings from 1/16 to 1 inch. The 63 burner head plates thus employed are shown in Fig. 1. Special port forms such as ribbon and slotted were also included in this investigation. These are illustrated in Fig. 2 together with large sized contemporary drilled port burners which were employed to check



3. *Illustrating effect of port spacing on lifting of gas flames. Port spacing on burner head was increased left to right from 0.05 in. to 0.5 in. Lifting occurred on ports spaced 0.17 in. or greater apart.*

4. *Illustrating effect of port spacing on tendency of flames to yellow tip. Pronounced yellow tips were noted at left, whereas flames at right were blue. Port spacing increased from 0.05 in. to 0.5 in. left to right.*

5. *Illustrating effect of rows of ports on tendency of flames to yellow tip. Yellow tips appeared in flame on two rows of ports on right half of burner, whereas no yellow showed in flame on single row (back row of ports blocked off) on left half. Note increased height of flame on right half having same air-gas mixture as left half.*

6. *Illustrating effect of port spacing on outer mantle flame height. Port spacing increased from 0.05 to 0.5 in. left to right.*

7. *Illustrating that outer mantle flame height on two rows of ports at right is twice the height of flames on single row of ports at left.*

8. *Illustrating that primary air has no appreciable effect on height of the outer mantle of a gas flame. Left and right halves of burner were adjusted at the same gas rate but with high percentage of primary air at left and low percentage at right. Outer mantle heights are equal.*

9. *Photograph showing that inner cone flame height is unaffected by port size. No. 36 D.M.S. ports at left. No. 26 D.M.S. ports at right. Same gas rate and same primary air.*

results obtained with the experimental unit.

Employing the various plates described, fundamental data on lifting, yellow tip, and flash-back limits, flame heights, and port discharge coefficients were secured. By changing only one variable at a time it was possible to show the relationship between them. Where different fuel gases would have an influence on the results, 3 test gases were employed ranging in heating value from 530 to 3200 B.t.u. per cu.ft. and specific gravities of from 0.38 to 2.0. They were selected as most representative of those commonly distributed in the United States as well as affording extreme differences in burning characteristics. To assure accurate and reproducible observations, all tests were conducted with accurate control of primary aeration, temperature of the air-gas mixture supplied to the ports, and burner head temperatures. Some of the apparatus employed for this purpose is shown in Fig. 1.

Lifting Held Undesirable

Except under conditions where an appliance is especially designed to utilize lifting and blowing flames, lifting is undesirable. It usually indicates that the gas may be only partially burned or that a small quantity of unburned gas is escaping from the flame. Ignition of a gas mixture at or above the lifting limit is difficult and flame travel from port to port is unreliable. Excessive lifting may produce disturbing noise. In addition, the efficiency of heat transfer under lifting conditions may be greatly reduced.

Appearance of yellow tips in an atmospheric burner flame represents the opposite extreme to the lifting limit previously described, indicating low percentage of primary air. Formation of yellow color in the flame is principally due to incandescent particles resulting from combustion of hydrocarbons. In most instances yellow tips are undesirable. On the other hand some burners are intentionally so designed in an attempt to increase the amount of radiant heat given off. Where yellow flame burners are employed, the combustion space required is generally larger than that for a blue flame type.

The third characteristic for measuring burner performance namely flash-back, is to be avoided at all times. Most undesirable results of flash-back are the generation of products of incomplete combustion, sooting, or clogging of interior of burners and orifices, and damage due to over-heating of burners. Further, flash-back usually creates an objectionable sound similar to a loud noise of extinction of flames. Lighting-back, wherein main burner flames flash outside the combustion chamber and light gas at the orifice, causes an undesirable condition similar to flash-back through the ports, but should not be confused with it.

Index of Burner Performance

These three limits (lifting, yellow tip, and flash-back) are so definite for each individual gas that they have long been employed as an index of burner performance. For a burner to operate satisfactorily on any given gas it must be so designed that its operating characteristics fall within these limits with a margin of safety. From the effects fully discussed in Bulletin No. 13 it is apparent that through proper evaluation of port design variables, flame characteristics may be readily controlled.

For the purpose of illustrating these effects resulting from port spacing, for example, a special burner head plate was prepared having ports drilled from 0.05 to 0.5 inch apart. Supplying all ports with the same air-gas mixture, lifting occurred more readily as port spacing was progressively increased, as shown by Fig. 3. At a spacing of 0.17 inch and greater under these conditions the flame was not held at the port and lifting was more pronounced.

To illustrate the effect of port spacing on yellow tip limits, Fig. 4 employing the same burner plate is shown. With the same air-gas mixture distributed to all ports, closer spacing of ports below ¼ inch resulted in a marked increase in yellow tip formation. In this illustration those flames on the right are blue while those more closely spaced together at the left show distinct yellow-tipped flames. It would, therefore, seem that port spacings greater than ¼ inch have no effect on yellow tip limits.

Multiple rows of ports of the same size and depth with the same spacing between rows as between ports in the same row do not apparently affect lifting limits. On the other hand, increasing the number of rows of ports has the same effect on yellow tip formation as that resulting from closer spacing of ports. With multiple rows of ports more primary air is required to eliminate yellow tips. This is illustrated in Fig. 5. To show the comparison between single and multiple rows with a given port size, port depth, and spacing, one row on the left half of the burner plate was blocked off. Whereas no yellow tips are shown in the flames on the left half, they appeared on two rows of ports on the right half of the burner.

Similarly it was shown that as port sizes were increased, greater percentages of primary air may be employed before lifting is encountered. Likewise, a greater amount of primary air is required to remove yellow tips. It was also shown that with larger port sizes a tendency for flash-back occurs over a wider range of primary aerations, thus limiting satisfactory operation of such burners.

Port Depth

Port depth within the range studied in this investigation has apparently no effect on yellow tip limits of a gas. However, a greater percentage of primary air is required before lifting is encountered with deeper ports. In addition, depth of ports has a marked effect on flash-back limits. It was shown that within certain limits, as port depth is increased, a larger port size could be employed before flames would flash back.

Another important relationship disclosed during the course of this investigation was the influence of port spacing, size, and depth on height of flames. It was shown that port spacing has a marked effect on outer mantle height of flames. This is illustrated in Fig. 6 employing the special burner head plate with ports of the same size spaced from 0.05 to 0.5 inch. Note how flame height increased from right to left as port spacing became closer. In Fig. 7 it is shown that mul-

(Continued on page 286)

Fewer Accidents . . . *in the Gas Industry*
Reported in Survey of Disabling Injuries

By EDWARD R. MARTIN
Statistician, American Gas Association

THE accident rates, frequency and severity, recorded by the manufactured and natural gas industry in 1941, were considerably lower than those reported in 1940. These rates are based on the summarization of reports received from 456 gas companies employing 117,349 workers who accounted for 236,380,375 hours of exposure. Approximately 85 per cent of the gas industry's employees in the United States are represented.

Frequency of Accidents

These companies reported a total of 3210.5* lost-time accidents. This indicates that for every 1,000,000 hours worked by gas company employees during 1941, 13.6 lost time accidents occurred. This was slightly less than the figure of 13.8 recorded in 1940. Looking at these injuries from the standpoint of employees, there were 2.74 lost-time accidents for each 100 employees, as compared with 2.83 for the preceding year.

There were 212,575 days charged due to lost-time accidents during 1941. In other words, for each 1,000 hours worked, 0.90 days were lost because of injuries. This is a sharp drop from the figure of 1.27 recorded in 1940.

The decreased severity of these injuries is further demonstrated in the fact that there were 181.1 days lost, and charged due to disabling injuries, for each 100 employees during 1941. This was far below the figure of 260.8 recorded during the previous year, and, with the exception of 1939, represents the lowest ever reported by the gas industry.

Classification of Lost Time Accidents (1941) Total Industry

The above rates are based on the total number of accidents, and the total days charged due to lost-time accidents. Breaking these totals down, there was reported:

	Number of Lost-Time Accidents	*Days Charged*
Deaths and Permanent Total Disabilities	22.5*	135,000
Permanent Partial Disabilities	76	27,681
Temporary Disabilities	3,112	49,894
Total	3,210.5	212,575

The 22.5* injuries classified as "Deaths and Permanent Total Disabilities" indicate there were, during 1941, .0192 such accidents per 100 employees. This, with one exception (1939) was the lowest ever recorded.

The Manufactured Gas Industry

Number of Reporting Companies	240
Daily Average Number of Employees	55,500
Total Number of Hours Worked During 1941	111,947,007

Frequency Rates

In the manufactured gas industry there were 14.0 injuries for every 1,000,000 hours worked during 1941. This indicates a rise from the figure of 13.5 recorded in 1940. The 2.83 injuries for every 100 employees likewise indicates an increase from the previous year's figure of 2.76.

Severity Rates

Despite the rise in the frequency of accidents, the severity rates were considerably below the 1940 level. For each 1,000 hours worked there were 1.04 accidents as compared with 1.21 in 1940. There were 209.0 days

THIRTEEN-YEAR SUMMARY OF ACCIDENT EXPERIENCE OF THE MANUFACTURED AND NATURAL GAS INDUSTRY IN THE UNITED STATES

These data cover the entire operations of reporting gas companies and the operations of the gas department only for combination companies

Year	*Number of Reporting Companies*	*Number of Deaths and Permanent Total Disabilities*	*Total Number of Disabling Injuries (Lost Time Accidents)*	*Total Days Charged Due to Disabling Injuries (Lost Time Accidents)*	*Frequency Rates*		*Severity Rates*		*Number of Deaths and Permanent Total Disabilities Per 100 Employees*
					Number of Disabling Injuries per 1,000,000 Hours Worked	*Number of Disabling Injuries per 100 Employees*	*Number of Days Charged Due to Disabling Injuries per 1000 Hours Worked*	*Number of Days Charged Due to Disabling Injuries per 100 Employees*	
1929	354	33	6,218	304,510	30.5	7.60	1.49	372.0	.0403
1930	449	53	5,801	475,665	21.3	5.33	1.75	437.0	.0487
1931	453	35	3,859	302,093	16.1	3.93	1.26	307.5	.0356
1932	443	50	2,690	382,443	11.9	2.85	1.69	405.3	.0530
1933	473	23	2,575	197,669	11.5	2.56	0.88	196.9	.0229
1934	422	22	3,260	223,864	14.7	3.04	1.01	208.9	.0205
1935	458	31	3,073	290,017	13.8	2.90	1.30	273.9	.0293
1936	457	30	3,616	288,378	15.4	3.28	1.23	262.0	.0273
1937	480	24	3,348	225,698	13.8	2.93	0.93	197.7	.0212
1938	446	23	2,825	223,114	12.0	2.51	0.94	198.1	.0204
1939	433	16	3,099	175,739	12.7	2.62	0.72	148.7	.0135
1940	449	36	3,429	316,436	13.8	2.83	1.27	260.8	.0297
1941	456	22.5	3,210.5	212,575	13.6	2.74	0.90	181.1	.0192

charged due to disabling injuries per 100 employees during 1941. This was well below the 1940 rate of 247.4.

Classification of Accidents (1941)
Manufactured Gas

	Number of Lost-Time Accidents	*Days Charged*
Deaths and Permanent Total Disabilities	13	78,000
Permanent Partial Disabilities	48	15,937
Temporary Disabilities	1,508	22,040
Total	1,569	115,977

The number of deaths and permanent total disabilities per 100 employees declined from .0283 in 1940 to .0234 in 1941.

The Natural Gas Industry

Number of Reporting Companies	216
Daily Average Number of Employees	61,849
Total Number of Hours Worked During 1941	124,433,368

Frequency Rates

The frequency rates established by the natural gas industry during 1941 rank among the lowest ever recorded. There were 13.2 lost-time accidents for every 1,000,000 hours worked during 1941; this compares with 14.1 for the preceding year. The number of disabling injuries per 100 employees fell from 2.89 in 1940 to 2.65 in 1941.

Severity Rates

Severity rates reported by the natural gas industry established new records. The 0.78 days lost for each 1,000 hours worked was far below the rate of 1.33 recorded during 1940. There were 156.2 days charged due to disabling injuries per 100 employees in 1941; this was a great decrease from the figure of 274.0 recorded during the previous year.

Classification of Accidents (1941)
Natural Gas

	Number of Lost-Time Accidents	*Days Charged*
Deaths and Permanent Total Disabilities	9.5*	57,000
Permanent Partial Disabilities	28	11,744
Temporary Disabilities	1,604	27,854
Total Lost Time Accidents	1,641.5*	96,598

* An accident resulting in the death of a combination company employee has been prorated as the company is unable to determine the responsibility.

Also establishing a new "low" was the number of deaths and permanent total disabilities per 100 employees. This amounted to .0154 in 1941, or less than half of the .0310 recorded in 1940.

This material is based on data published in bulletin form by the Statistical Department of the American Gas Association—"Accident Experience of the Gas Industry for 1941," Statistical Bulletin Number 47. Contained therein is the accident experience of individual gas companies, designated by code numbers; various tables comparing companies of similar size and by type of gas served (manufactured or natural). A section is also devoted to the accident experiences of gas companies operating in the Dominion of Canada. There is a charge for this bulletin of 25c to members, and 50c to non-members.

This data was collected in cooperation with the National Safety Council.

Gas Change-Over in Flint Area

ADJUSTMENT of customers' appliances to burn natural gas instead of manufactured gas began late in May in the Flint division of the Consumers Power Company and continued for some weeks until the premises of some 40,000 customers were visited. Some 200 trained service men were engaged in the job.

Natural gas now being supplied to the Flint area is from the Michigan fields. A pipeline extension which will bring Texas and Kansas gas to Flint is under construction near Adrian. With the completion of this pipeline, and a branch running west through Jackson to Kalamazoo, natural gas will be available to every community which Consumers now supplies with manufactured gas except Manistee, Alpena and Sault Ste. Marie.

The project is scheduled for completion during the present year.

A Pat on the Back

THE following letter from a New England utility executive, dated June 30, speaks for itself:

"Copies of 'The A. B. C. of Occupational Deferment Procedure' recently sent out from A. G. A. Headquarters have been received by member companies in our organization. This information has been very opportune and valuable, in fact, so valuable that we would like your permission to use it among the electric companies in our Association.

"You are to be congratulated on the excellent material the A. G. A. is releasing for the use of the gas industry and the Occupational Deferment Procedure is only one example of this."

The deferment procedure recommendations were prepared by the Committee on Personnel Practices headed by James D. Dingwell, Jr., of the Washington Gas Light Company.

Emergency Wrinkle

SINCE grease and other emergency methods of shutting off the gas flow in mains are not considered practical in high pressure mains over 4 inches in diameter, the Southern California Gas Company, Los Angeles, has developed a hydraulic ram which solves the problem. Capable of exerting a pressure of 50 tons, this ram is used to pinch two sides of the exposed end of the steel pipe together. Even though the flow of gas is not completely stopped, it is reduced to a point where it can be easily controlled.

Scrap Drive Under Way

A MILLION and a half to two-million-dollar advertising campaign on salvage was announced in June by Robert W. Wolcott, president of the Lukens Steel Company and chairman of the Scrap Committee of the American Iron & Steel Institute. The campaign will present not only the vital need for scrap iron and steel for war production, but will deal also with rubber, non-ferrous metals, cooking fat, tin cans, and other salvageable materials.

McCann-Erickson, Inc., has been selected to handle the campaign. This agency also conducts the gas industry's national advertising campaign.

Pittsburgh Appointments

UPON the retirement of Joseph McKinley, vice-president in charge of sales for the Duquesne Light and Equitable Gas Companies, G. W. Ousler was placed in charge of the sales and service activities, effective June 1, for the Duquesne Light Company and the Allegheny County Steam Heating Company. F. B. Jones was appointed in charge of sales and service activities for the Equitable Gas Company and the Pittsburgh and West Virginia Gas Company.

A. G. A. PUBLICATIONS

A list of all A. G. A. publications is available upon request to

AMERICAN GAS ASSOCIATION
420 Lexington Ave., New York, N.Y.

Gas in the News . . . *How Publicity Is Maintaining Contact on the Home Front*

By HENRY F. WOODS*

Director of Publicity, McCann-Erickson, Inc., New York, N. Y.

SIX years ago publicity, working in harmony with and complementing and supplementing the gas industry's national advertising, set out to promote public acceptance of gas as a modern, efficient fuel for household, industrial and commercial purposes for which heat is required. We have since been employing this powerful medium to build up and establish in the minds of millions of housewives throughout the nation the feeling that gas is a thoroughly modern cooking fuel and that the appliances which use it are in every respect equally modern.

During this period many thousands of different newspaper clippings of material produced and released in this effort have been received from newspapers in all parts of the country. The total circulation represented by these newspapers was almost 350,000,000 and our gas publicity occupied some 5,000,000 lines of editorial space.

Press Returns

In addition, leading consumer magazines with an aggregate circulation of 238,389,000, printed 167 different articles favorable to gas. During this same period we prepared and distributed to radio stations 72 different radio talks, each containing many favorable references to gas, each stressing its modernity. Our returns indicate that to date 1,743 of these talks have been broadcast.

Publicity has been a very definite factor, we believe, in improving the public attitude toward the gas business. Together with national advertising it has done much to accelerate the shift of public opinion to gas and gas appliances. It has also been instrumental in accomplishing for the gas industry some very definite public relations benefits. It has, I am sure, made more effective the multiple public relations programs of progressive individual companies throughout the country. It has had a share in making the public much more cognizant of the public service aspects of the gas industry and has aided in developing a higher degree of loyalty toward gas on the part of present users.

All this has been by no means a hit-or-miss program. We have never attempted to secure a large volume of publicity for gas merely as a generic term. On the contrary, we have sought always to make every single news release fit into a definite publicity pattern, to follow a pre-conceived plan which was worked out six years ago.

War-Time Changes

Today, your industry faces new publicity and public relations problems. You occupy a changed position in a country whose whole economy has virtually overnight undergone a radical alteration. Your industry has been converted swiftly and unobtrusively from a peace-time servant of the public to a war-time aid of the entire country. With this change has come the necessity for changes in the publicity and public relations activities in which you must engage for the duration.

As all students of public opinion freely admit, our people are today interested primarily in only one subject: The war—and what we are doing to win it. The same public which is normally interested in new models of gas ranges or other appliances today relegates this subject to a minor position. Instead, it wants to know how best to use its present range for the duration.

The gas industry has, therefore, a new responsibility to its public. It must meet this responsibility in several ways. First, it must convince the public that it is acting today in the national interest. It must solicit public appreciation of the extent to which the industry has gone all out for war without, at the same time, lessening the very vital public service it performs in supplying millions of Americans with gas for cooking, water heating, house heating and refrigeration.

But, it must also do other things. It must help to teach women how to cook under the new war-time conditions, when many items of food may be scarce, if they are not rationed. There will be more cooking of such foods as dried peas, beans, fruits and of those fresh vegetables which were previously canned. There may even be more use of frosted and of dehydrated foods. Millions of women must be told how to prepare many of these foods properly and, to a very large extent, it will be your industry's duty to tell them.

Quite aside from the duty of doing this, your actions in this regard will build new good-will and prestige and will emphasize the many advantages of gas cookery, demonstrate its flexibility and point to its modernity.

Conservation Data Given

You may believe that these changed conditions will make necessary radical changes in your publicity program. The actual truth of the matter is that we have already recognized these changes. Publicity is a flexible medium. It serves best when it is keyed to the interests of the public. Your publicity has been keyed to these interests all along. In fact, it has anticipated them in some cases.

As far back as last August and September, we released material on the care of the modern gas range. For example we distributed a newspaper mat release headed: "A Clean Range Is New Longer." This explained to the reader that, although a modern gas

* Since Mr. Woods wrote this article he has resigned as director of publicity for McCann-Erickson, Inc., to accept a position in the advertising and sales promotion department of the Standard Oil Co. of New Jersey.

range lasts practically a life-time, its newness can be prolonged indefinitely —and then goes on to tell the reader just how this can be accomplished. Another release gave a detailed story on "How To Take Care of a Gas Range and How To Get the Most Out of It." This story went out to national magazines last September. We also sent it to syndicates and to newspaper editors. We beat the gun on the Government publicity by urging householders to take better care of their appliances. Consequently, we were able to get the publicity break for gas.

Sugar is news today. It was news in January, too, when the present acute shortage which as compelled rationing, was first threatened. We tied-in the accelerated news interest of sugar with the modern gas range by releasing stories which suggested to homemakers several ways to get sweetness in their foods without the use of sugar.

Aluminum Drive

This material was released last April. You will remember the aluminum drive, when we were all asked to contribute our aluminum to aid national defense. We issued stories which tied-in with that patriotic effort and again took advantage for gas of the news interest in that subject. We pointed out that "all kitchenwares last longer with the modern gas range because it provides controlled temperatures in any degree desired." In another release we told how the old iron kettle, now come once again into its own, is ideal for pot-roast, "it is so easy to use over a top burner of the modern gas range." Still another release at this time gave editors a variety of material on kitchenwares, at the same time adroitly plugging gas, emphasizing its modernity and stressing the features of modern gas ranges.

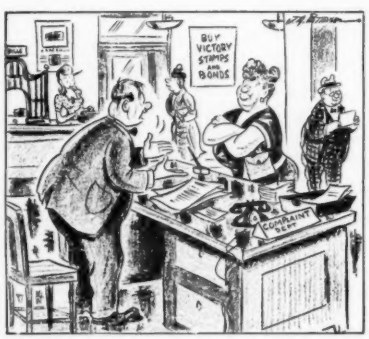
Nutrition is still a newsworthy subject. We saw it coming. In months gone by we began to stress this angle in our news releases. In December of last year, we issued a release which pointed out that cooking-for-health is now of vital significance to all homemakers. "America, with its 17,500,000 modern gas ranges," your publicity explained, "can cook to save health-giving vitamins and minerals more easily and effectively than any country in the world."

We are not clairvoyant. We don't look into crystal balls, but we do read the newspapers and the magazines and we do know what's going on. With some degree of accuracy we are able to see just when and where public interest is shifting and to take advantage of these shifts. For example, we aren't sure that conservation of gas will be necessary. But we wanted to be prepared, so in late January, we released a story urging the homemaker to get every bit of value out of every bit of fuel she uses. No housewife could read this sound advice without being convinced that gas is the ideal fuel and that it's as modern as a new flying fortress.

Your industry will have more uses for publicity in this war period than it ever has had before. Publicity and national advertising will help keep your public with you. It will reach the front you must continue to reach for the duration—*the home front.* You sell to the women. They read and listen to your story. They make the buying decisions. And the women are just where they have always been, only more so now than ever, in the homes and in the kitchens of the homes. Moreover, the domestic load will always be your most profitable load. It represents the real hold you have on the consumer. Publicity will help maintain that hold.

Publicity is primarily an instrument for informing masses of people. It will continue to be used to inform the American public of the part your industry is playing in our war effort. It will inform American women how best to cook foods with gas. It will inform the public on the importance of nutrition in war-time and will tell them how to cook foods to secure maximum nutritional benefits. It will inform them how to make their present equipment last. It will inform them, if necessary, on the need for conservation and on how to conserve. And in informing them of these things, the basic, all important story the industry must continue to emphasize, the story of the modernity of gas, will continue to be told, subtly, continually, interestingly and forcefully along a wide front.

During this period of revolution in American living, American buying habits and American thinking may be expected to change. But the gas industry's cooperative advertising and publicity campaign should function as insurance against changes which will be detrimental to the industry's and the public's best interests. Its position will be entrenched and it will emerge from the war with a public more friendly, more receptive to its sales messages and more eager to buy its products and use its services than ever before.



—Public Utilities Fortnightly.

"I'm sorry, Madam, but we can't put vitamin B-1 in your gas supply"

Safety Guides

AT its last meeting the Accident Prevention Committee of the American Gas Association decided that no additional guide for Safety Conference Programs would be undertaken at this time. However, it desires to call the attention of member companies to consolidated reports on this subject (Interim Bulletins No. 11 and 12) which are available at headquarters.

Gas Replaces Gasoline as Truck Fuel

WHEN Frank Parisi, of Rockaway, N. J., says he has a tank full of gas for his truck, he isn't talking about gasoline.

Mr. Parisi has overcome the inconveniences resulting from gasoline rationing by using illuminating gas, which he purchases for about $6 a tank.

He puts the tank in the back of the truck, connects the outlet valve to the carburetor with a piece of garden hose and starts the motor. The amount of air mixed with the gas is regulated by the accelerator pedal.

Mr. Parisi says that when he has eliminated the gas odor—which is pretty strong —and has rigged up a dashboard control for the supply of gas fed to the carburetor, he will have a perfect substitute for liquid fuel.

Wood Gas Stoves

A WOODEN gas range sounds like a joke of the golden bantam variety, on the order of the cast iron ear muffs and the rubber monkey wrench.

Yet mid-western stove manufacturers, according to the sedate and factual *Wall Street Journal*, no less, are already playing around with pressed wood fibre as a possible answer to the metals shortage in the home equipment field. This material, the story says, has excellent insulating qualities and could be used in the manufacture of gas ranges.

Almost as startling is the declaration in the same story that glass, terra cotta and even cement are also being tried out by members of the Illinois Manufacturers Association in seeking a substitute for metal stove material shut off by war demands.

One down-state manufacturer, it is stated, has produced a glass stove already, while a terra cotta producer in Chicago says that his company at one time made a limited number of terra cotta stoves, resembling somewhat the chinaware stoves in use in Europe.

All of which seems to indicate that the war can freeze the products of American industry but not its ingenuity.

—*Gas News.*

T. J. Danehy Dies

THOMAS J. DANEHY, vice-president and manager of the Wisconsin Fuel & Light Co., operating the gas utility in Manitowoc, died May 31.

Mr. Danehy was an active participant in the work of the Gas Section of the Wisconsin Utilities Association, having served as chairman in 1935.

Bureau of Mines Data on Gas Wells

SEEKING more effective methods of developing extremely deep condensate-type oil wells, especially in the Gulf Coast area of Louisiana and Texas, the Bureau of Mines has studied experimental data obtained from one well in which gas and liquid constituents of reservoir fluids were subjected to a wide range of tests, Dr. R. R. Sayers, Director of the Bureau of Mines, announced today.

Data were obtained for the complete range of pressure, temperature and mixture proportions in efforts to provide a reference scale for evaluating properties of fluids produced from similar wells at different gas-liquid ratios. The gas and liquids obtained from one well were recombined in different proportions to provide ten natural hydrocarbon mixtures for study at pressures up to 5,000 pounds per square inch and at temperatures ranging from 70 degrees to 280 degrees Fahrenheit.

The research was conducted under a co-operative agreement between the American Gas Association and the Bureau of Mines. Tests were conducted at the Bureau's Petroleum Experiment Station, Bartlesville, Okla., by Kenneth Eilerts, physical chemist, and R. Vincent Smith, assistant chemical engineer.

A copy of the report, Report of Investigations 3642, "Specific Volumes and Phase-Boundary Properties of Separator Gas and Liquid Hydrocarbon Mixtures," may be obtained by writing the Bureau of Mines, Washington, D. C.

L. O. Gordon Dies

LEROY O. GORDON, widely known utility executive, died June 17 in Birmingham, Ala. He was 59 years of age.

Mr. Gordon, who was president of the Peoples Water and Gas Company, went to Birmingham from New York to direct the southeastern operations of his company. He was a prominent member of the American Gas Association.

Advertising Lends a Helping Hand

HOW CAN I SECURE A NEW GAS RANGE?
WHY CAN'T I BUY A NEW GAS REFRIGERATOR?
CAN I BUY A NEW GAS WATER HEATER?
HOW DO I GET A PRIORITY NUMBER?
CAN I GET GAS SERVICE FOR DEFENSE HOUSING?
CAN I HEAT MY NEW HOME WITH GAS?

LET'S ALL HELP TAKE THE LOAD OFF THE SHOULDERS OF THE WAR PRODUCTION BOARD!

The War Production Board has a tremendous job to do—the job of making possible the winning of this war. They are doing a swell job and we should all help them in any way possible.

How? By letting them perform their duties with as little interference from the outside as possible. They are charged with the task of converting the many products formerly used by civilians to the production of materials necessary for our armed forces. Yes, their rulings will affect the daily lives of every citizen of this nation. But every ruling they make has a reason and it is necessary or it would not be made. Sure the War Production Board will make mistakes because they are human beings and they are moving fast. However, you can rest assured they will correct any injustice just as soon as humanly possible, so let's help them get their important job done by not criticizing and interfering unless absolutely necessary.

THE GAS INDUSTRY WAS ONE OF THE FIRST AFFECTED

Gas appliances and gas service were among the first civilian necessities affected by a limitation order issued by the War Production Board. *It was a wise move because gas is an essential fuel in war production plants throughout the nation.* The metals used in the manufacture of gas appliances were badly needed to make more tanks, ships and guns. No loyal citizen can criticize this move. Sure the gas industry would have liked to continue its progressive sales program and expanded its services instead of being stopped in its tracks, but we are glad to do anything to help the cause. We welcome the opportunity to work with the War Production Board and will carry out their every wish as near as is humanly possible. We don't want to do just the minimum but we want to do more than our share if possible.

HOW CAN WE ALL HELP?

When the limitation order on gas and gas appliances was issued it affected many of our customers. We are sure that they may have many questions in regard to gas service and gas appliances which they would like to ask. They may not understand some of the orders issued by the War Production Board. *Instead of writing a letter to the War Production Board or calling them, why not write or call your gas company?* Imagine the time it would take the busy War Production Board to answer just 500 letters or to answer 200 telephone calls. They could be using this time to further the war effort. We know most of the answers, and if we don't know we will gladly secure the correct information for you. We will even send a representative to your home with whatever information you desire if this would be more convenient for you.

Naturally it would be easier for us to refer all complaints and inquiries to the War Production Board but we don't want the easy way because we feel that it is our patriotic duty to do everything we can to help make their important task easier.

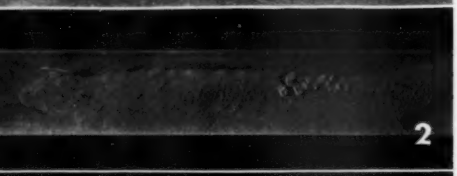
So if you have questions or want any information in regard to gas service, gas appliances or any of the orders issued by the War Production Board affecting the gas industry, call your gas company and it will be a privilege for us to be at your service. In this way we can all have a small part in helping lift the burden off the shoulders of the War Production Board.

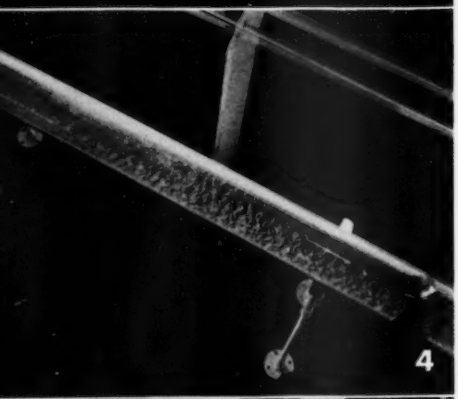
"Keep 'Em Flying!"

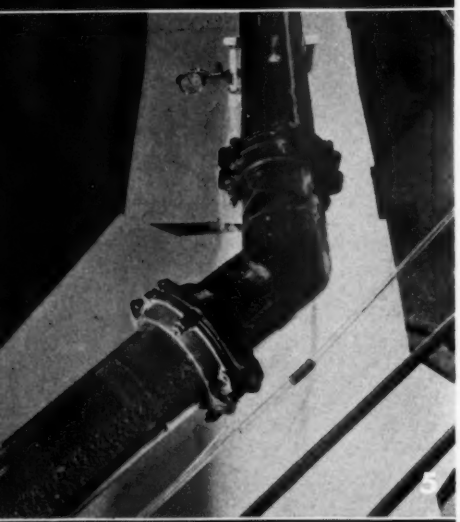
Buy U.S. WAR SAVINGS BONDS • STAMPS

KANSAS CITY GAS CO.

Advertisement of the Kansas City Gas Company and the Gas Service Company which attracted widespread attention because of its timely patriotic service. Commenting on this type of utility advertising, H. M. Brundage, chief of the Appliance Section, War Production Board, said: "The speedy and successful conclusion to this war is determined more by the tempo of the public mind than any other single factor. . . . . A national program of this type helps substantially to foster a sympathetic understanding of war problems. It is a commendable program"







Experimental Data with Wet and D
On Pipeline Transmission an

By G. M. KIRKPATRICK

Blaw-Knox Co., Pittsburgh, Pa.

IN connection with our study of the operating characteristics and efficiency of the Blaw-Knox gas cleaner, it appeared desirable to attempt to simulate conditions as they were thought to exist in gas transmission lines and to do this with the use of glass pipe so that visual evidence could be obtained. Work has therefore started and some progress made before the present emergency curtailed further work. The following is a brief statement of much of the work accomplished to date.

Study and subsequent operating experience indicated the following lines of attack as capable of furnishing interesting useful data.

1. Manner in which dust is laid down in a line.
2. Circumstances and way in which dust moves in the line.
3. Action of dust and liquids about an orifice plate.
4. Effect of dust and liquid on orifice meter measurement.
5. Movement of dust and liquid through a sag or underbend in the line.
6. Movement of dust and liquid through an overbend in the line.

To facilitate the work a standardized 3" orifice meter run was installed in series with various arrangements of 4" I.D. glass pipe, and to observe the effect of dust on orifice meters, an orifice was carefully installed in the 4" glass pipe in full view as subsequent pictures indicate. Every effort was made to insure utmost accuracy of measurement and suggestions made by the Pittsburgh Equitable Meter Company, by Columbia Engineering Corporation and by Prof. Beitler of Ohio State University were carefully followed out.

One of the initial arrangements is shown in Fig. 1. On the extreme right is a high pressure motor driven blower discharging downwardly into the 3" horizontally disposed standardized meter run fitted with straightening vanes and 1¼" orifice plate. At the discharge end of this run means are provided for introduction of measured amounts of dust or liquid. This carries on into the 4" I.D. glass pipe also fitted with flow straighteners and orifice plate as shown. Pressure taps from both orifices were carried to the one instrument board. This board was fitted with three inclined tube manometers, 2 common U gages, 2 Emconometers and a barometer. Thermometers were inserted directly into the line adjacent to the orifice plates.

Through this arrangement, it is readily realized the downstream orifice plates may be made to operate subject to dust and liquid entrained in gas and its differential and coefficient may be determined and checked against the clean 3" line orifice. This makes possible quantitative determination of

TABLE I

I. Chemical Analysis of Dust Sample:

	Per Cent by Weight
Moisture—110° C.	3.65%
Combustible matter	13.42%
Fe_2O_3	50.19%
Fe_3O_4	26.95%
SiO_2	1.67%
Sulphur	.22%

II. Sieve Analysis of Dust Sample:
Ro Top sieve shaker used for test
Time of Runs—45 minutes
No. of Runs—3
Size of Samples—500 grams

	Per Cent of Particle Size Ranges. Average Per Cent of Three Runs
On 10 mesh	1.33%
" 20 "	1.87%
" 30 "	2.82%
" 48 "	4.60%
" 65 "	4.57%
" 80 "	3.78%
" 100 "	3.59%
" 150 "	11.05%
" 200 "	18.15%
" 250 "	14.43%
" 325 "	13.85%
Through 325 "	19.88%

d Dry Dusts To Determine Effect and Orifice Coefficients

the effect of dust on orifice meter measurement.

In these tests air was used as the gas, velocities inside the clear 4″ I.D. glass pipe were varied from four miles per hour to 21 miles per hour and pressure was held quite constant at about 4″ of water gage. The dust used was taken from an old gravity type dust trap formerly in a natural gas line supplying the city of Pittsburgh. Its analysis is given in Table I.

Summarizing notes and pictures some general conclusions may be drawn. Following the lines of attack given above:

Figures 2 and 3 illustrate a typical manner in which dust is laid down when the gas has been caused to swirl or flow in a spiral path by reason of a 90° elbow. In these illustrations flow is from left to right and views are from nearly vertically above glass pipe. Note: Clean glass which was immediately adjacent elbow; deposition of fine dust first; flow lines of nearly 45° angle; sand dune or ripple formation of dust especially in Fig. 2 heavy dust still on leeward side.

Figures 4 and 5 illustrate dust formations when flow straighteners were used to enforce straight-line flow. View, Fig. 4 is from the side and above pipe. Gas flow is from right to left, toward flow straighteners in glass pipe and after same in steel pipe. Note ripple formation at angle to pipe and especially the large particles scattered throughout length of run; also stream lines on entrance side of flow straighteners. In Fig. 5 line is still in horizontal position but 45° elbow has been installed. Flow is from lower left hand corner toward elbow and away from observer or camera. Previous to this run glass pipe had been oiled on lower inside half to see how much dust would be caught and how; this to stimulate condition of condensation forming in line and subject to dust entrained from some other zone. Again note large particles scattered throughout run; owing to thin dust deposit only very fine ripple formation evident.

Observations made during these four runs and others disclosed a condition not previously anticipated; it may be briefly described as follows: An analysis of an average gas sample may disclose a small amount of dust entrained, actually though the total amount of dust moving down the line may be many times in excess of that figure because the surface of the sand dunes or ripple formations is in constant motion. The action is like water running over clean sand, the front corners of large particles are undermined and subsequently they are tumbled end over end to deposit and be undermined again. Where straight line flow existed there was no observable evidence of sedimentation in a clear open line. Sedimentation did occur at elbows and orifice plates or in the presence of spiral flow. The rate of progress of the moving sand dunes seemed to have some relationship to the velocity of gas.

Fig. 6 is a view taken from the side and slightly above, with a 2″ orifice plate installed in the 4″ I.D. glass pipe. Gas flow is from right to left. The dust shown was laid down at a velocity of 4 miles per hour. Note: Particle size, sedimentation in front of orifice, heavy deposit fine dust on downstream side, characteristic lack of deposit adjacent plate.

Fig. 7 is looking at the upstream side of 1¼″ orifice plate in 4″ I.D. glass pipe, verticle lines on side of pipe caused by dust sliding down due to vibration, dust laid down at about 8 miles per hour. Note: Approximately half of plate coated with dust, contour of deposit immediately against plate, heavy black deposit beyond plate then clear glass, then deposit beginning again, cleared glass represents about 2½ pipe diameters in length following a deposit next to the plate of about 1¼ diameters.

Fig. 8 is a view from above and in front of the orifice while gas is flow-

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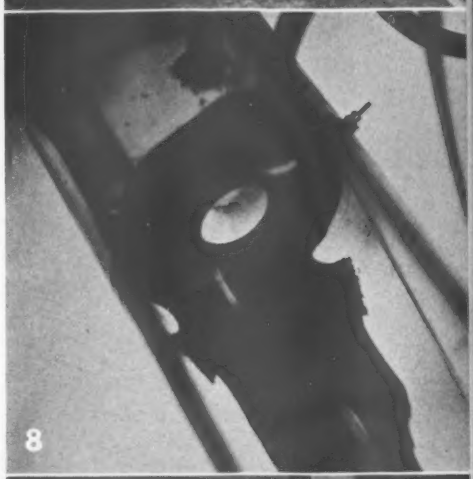
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9

ing. Velocity at this time was 18 miles per hour. Orifice is 1¼". Note: Stream of dust passing over lower edge of plate, hammerhead-like shape deposit in front of plate, and dark shadow through orifice plate on downstream side, see Fig. 9 for view of latter.

Fig. 9, picture was taken immediately following Fig. 8. This illustrates a very interesting and unanticipated action on the downstream side of the 1¼" orifice. Velocity of gas in main line 18 miles per hour, velocity through orifice disregarding contraction factor equalled 8100 ft. per minute, dust entrainment same as Fig. 8. In spite of the high velocity through the orifice there was extreme turbulence evident for distance of about 2½ pipe diameters downstream of the plate. Dust movement characterized by complete discontinuous motion, at moment picture taken dust is moving in upstream direction, movement of dust was up and down line, vertically up and down in pipe and laterally at times directly across the jet issuing from the orifice, only probable organization of movement faintly evident was tendency to form swirls or vortices, the violent agitation kept the glass swept clean.

In Fig. 10 is shown the effect at the orifice of feeding a small stream of oil into the far upstream end of a dead level line. Under influence of friction with moving gas stream oil flowed slowly along dirty line and reaching orifice plate it cut away dust deposit as shown. View is of upstream side of plate. The change of contours in the orifice approach zone caused this plate to read nearly 12% slow. Main line velocity 21 miles per hour. Note even pattern of dirty oil on downstream side for 15/16" next to plate then sharp line of demarcation with flow lines downstream. Line of demarcation passes through center of manometer pressure tap opening.

Fig. 11 shows condition on upstream side of orifice plate which was subjected to dry, wet and then dry dust. Test results indicate this is worst possible condition. At this time orifice read 20.2% slow in reference to clean standardized meter upstream.

In order to get some idea of what may take place in a sag or underbend in a gas line the glass pipe was set up with one joint sloping down to a 45° elbow and the second joint sloping up and away from the ell. Fig. 12 is a view looking down on the elbow and the inlet side joint of pipe from a point above and to one side of the line. Slightly less than one quart of oil had been introduced in the upstream end of the line and then dry dust blown in. Dust deposited and was held by the oil in the downwardly sloping line. But of most interest was the heavy deposition of oily dust in only the upstream half of the elbow. The oil collected and remained in only the downstream half of the elbow. Eddy currents formed at the bend lifted dirty oil vertically up and curving slightly back to the top center line of the pipe. Surface agitation of the oil formed waves which were blown up the downstream joint of pipe some distance depending on gas velocity, catching on the pipe wall the oil would flow to the bottom center line of the pipe and run down the slope in the form of waves. The dust deposit shown is about 1⅜" deep at the crest or turn of the ell. Pressure losses through the underbend were varied from .011" of water with clean pipe to about 2½" with much liquid present. With even more liquid present pressure losses increased but surging was so great as to prevent any accurate readings on the manometer. Distance between pressure taps for the manometer was 117" mean, elbow in exact center.

Observations were also made with the pipe and elbow placed to simulate an overbend. Turbulence and eddy currents precluded obtaining any accurate data on pressure losses. Additional experiments will be necessary with other arrangements before reliable data can be collected.

We wish to publicly express our appreciation of the help and encouragement given us in this work by T. H. Kerr, vice-president, and Clyde C. Phillips, general superintendent of the Ohio Fuel Gas Company, Allan D. MacLean and Howard Evans of the Pittsburgh Equitable Meter Company, John Overbeck and Mr. McNichols of Columbia Engineering Corporation and Prof. Beitler of Ohio State University. Through their help much was done to improve accuracy of test data collected and the trend or direction of experiments was given more practical interest. It is hoped that after the "duration" this work may be continued.

SIGNS OF THE TIMES

In Portland, Oregon, the Millionaires' Club has just installed an automatic gas deep fat fryer in order—guess what?—to save fat!

Emergency Shut-Off . . . *of Gas Mains with Inexpensive and Removable Material*

By P. W. GELDARD

The Consumers' Gas Company of Toronto, Toronto, Ont.

THE experiment outlined below had its inception in the work of Messrs. Andersen[1] and Goldsmith,[2] in shutting off gas mains by pumping grease into the mains. Our thoughts were led in search of a material which would be cheap and, above all, a material which could be rapidly and easily removed from the mains. In addition, due to the high cost, especially in Canada, of power operated pumps for introducing the grease into mains we sought some cheap method of pumping.

After many experiments, George Hill, inspector of valves, governors and manholes, The Consumers' Gas Co. of Toronto, developed a material which seems to answer our requirements. It is cheap and made from easily-obtained materials, gives a perfect shut off and can be easily removed from a main.

Formula for Mixture

The formula is 6.0 per cent by weight of gelatine, 2.0 per cent by weight of molasses and .25 per cent by weight of aqueous solution (15%) of Phenol. The gelatine which gives body to the mixture is Crystal Powder number L 2333, a product of Meredith Simmons & Co. Ltd., Toronto. The molasses, which gives adhesive qualities to the mixture, is any commercial molasses. The Phenol solution is added to inhibit the formation of bacteria.

To make a 100 lb. batch, pour four and one-half gallons of cold water into a container, sprinkle the gelatine into the water, stirring constantly. Allow mixture to settle for thirty minutes then add molasses and Phenol solution, plus four and one-half gallons of boiling water. Stir thoroughly for three minutes and then allow to set for three hours. The material, as made, will dissolve in water at 100 degrees F. and will set in some three hours at a temperature of 65 degrees F. When ready to use, mash to the consistency of crushed ice and place in pump.

Pump Is Hand-Made

Our garage foreman made up a pump as shown in the sketch. The container consists of a 10-gallon oil drum and the piston and cylinder consist of two pieces of machined three-inch steel pipe. The legs of the pump were screwed to a plank and the pump was operated by one man turning down the follower plate while another man worked the pump lever. We arranged a piping set-up as shown in the sketch. Three lengths of six-inch cast iron pipe were laid on a slight grade with a rod drip at the lower end. Recording gauges were set at each end of the cast iron pipe. A gas line with a governor for controlling pressure was connected to the upper end of the cast iron pipe. At the center of the cast iron pipe a 1¼" service 16' long was connected at right angles to the cast iron pipe and from the end of this 1¼" service 30' of 1½" rubber hose was run to the pump.

The inlet pressure to the cast iron pipe was set at 5" water gauge and a small leak, about 25 cubic feet per hour, was introduced at the lower end of the cast iron pipe. The idea being that as soon as a shut down in the main had been achieved, a drop in pressure to zero would be registered at the pressure gauge at the lower end of the cast iron pipe. Also the slightest break through in the stoppage in the main would show a build up on the pressure gauge and the gauge would also show the time that the break through occurred. The set-up also enabled us to raise the inlet pressure and find out at what pressure a break through would occur.

During the experiment, the outside temperature varied between 45 degrees F. and 70 degress F. The pump was started and the following results observed: The thirty feet of rubber hose was filled with shut-off material in two minutes and the 16' of 1¼" pipe in a further 1½ minutes. The first drop on the pressure gauge was registered 7½ minutes after the pump was started and a complete shut-off achieved 9½ minutes from the start of the pump. At this point sixty pounds of material had been used, of which thirty pounds were in the hose and service and the remainder in the main.

No Break in 49 Hours

The set-up then stood for 49 hours with absolutely no break through occurring. At the end of this time the 1½" hose which was filled with material was replaced with an empty hose to simulate conditions which would be used in service. The pump was filled with boiling water and started. After two minutes had elapsed, pressure at the lower end of the 6" main began to build up denoting a break through at the stoppage. The stopping material was completely removed in ten minutes by being pumped out of the main through the rod drip. Fourteen gallons of water were required to remove the material. The experiment was repeated again and after standing with a complete shut down for twenty-four hours the inlet pressure was raised until a break through occurred. A slight seepage of gas, about 10 cubic feet per hour, occurred when the inlet

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Presented at Annual Convention, Canadian Gas Association, Montreal, Quebec, June 4-5, 1942.

[1] "Grease Method of Making Emergency Shut-Offs of Small Low-Pressure Mains," H. B. Andersen, A. G. A. MONTHLY, July-August 1941, pp. 258-260.

[2] C. S. Goldsmith, The Brooklyn Union Gas Company, A. G. A. MONTHLY, November 1941, pp. 379. Also see "Air Defense Methods for Repair of Gas Mains Damaged by Bombs," G. E. Szekely, A. G. A. MONTHLY, April 1942, pp. 127-130.

pressure reached 12 inches water gauge.

The above work had been done within the last three weeks and there has been no opportunity, as yet, to try it out in actual service conditions. For instance, we have yet to find out how much water will be required to dissolve and move the material say 500 feet to a drip. However, we feel that with further experiments and trials we are on the track of a practical and economical method of shutting down mains in cases of bad breaks such as are caused by bombing.

Gas Rationing in Ireland

RATIONING of gas in Dublin was put into operation many months ago and has been carried out in three stages: First by a gradual reduction of pressure, secondly by a gradual reduction of calorific value, and thirdly by cutting down its use to fixed hours in the day. Pressure has been reduced in the city from a normal of 5 in. to below 3 in. on the peak load. Calorific value was reduced in stages from 475 to 450 B. Th. U., from 450 to 425, and in the third stage from 425 to 400.

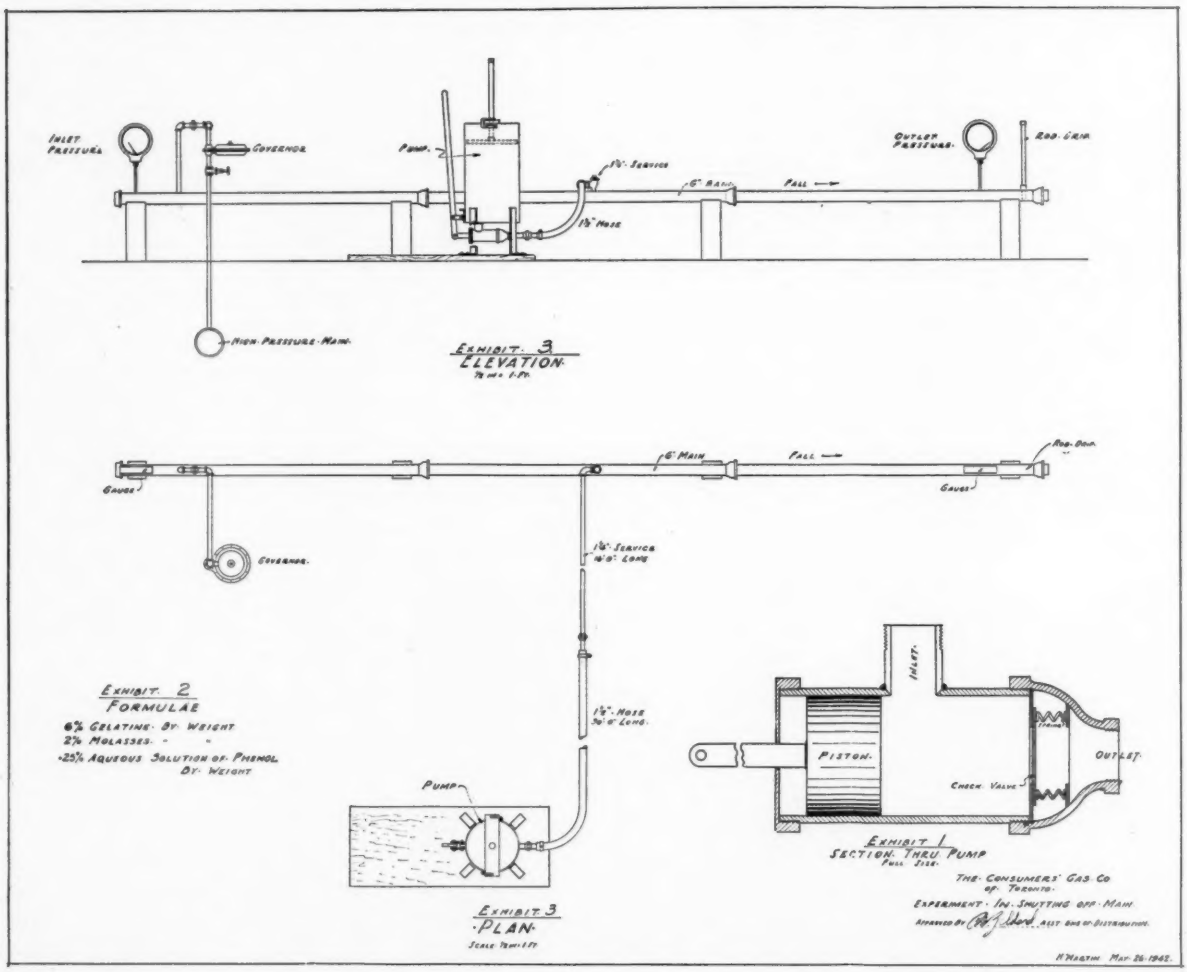
Before period rationing was introduced, efforts were made by advertising and house-to-house visits to get the public to cut down consumption, but these methods had little effect. Period rationing was introduced on March 3 as follows: Gas was made available from 7 to 8:30 A.M.; 11:30 to 1:30 P.M.; and 5:30 to 10:30 P.M.—on Sundays, 10:30 to 1:30 P.M. These hours were subsequently altered by extending the morning period from 5 A.M., instead of 7 o'clock.

Coupons for gas, coal, and electricity may be necessary in Belfast very soon. The first intimation of this was given to the members of the Gas Committee of the Belfast City Council by the head of the gas company.

Housewives will be provided with coupons for coal, gas and electricity. When the gas inspector comes round to inspect the meter, he will take a note of how much gas has been used during the quarter, and then ask for the requisite number of coupons. For coal the unit will be one hundred pounds. The scheme, which is to be sponsored by the Northern Ireland Government, is still in its infancy and the question of the number of coupons for the different services has not yet been decided.

Million Man-Hour Awards Available

A MERIT Award Certificate is available to any member gas company of the American Gas Association or division thereof which has completed one million or more consecutive man-hours without a disabling injury accident. Rules and regulations are available upon application by A. G. A. member companies. The Award Certificates will be presented to presidents of the winning companies at the Annual Meeting of the Association. Further information may be secured from the Accident Prevention Committee, American Gas Association, 420 Lexington Ave., New York, N. Y.



National Better Copy Awards Made at Advertising Convention

Clara H. Zillessen

WITH Al C. Joy, of San Francisco, president of the Public Utilities Advertising Association, presiding, the convention of that organization held in New York, June 22-24, was an outstanding success. Attendance was perhaps the largest in the history of the organization and the addresses, without exception, made valuable contributions to war advertising knowledge.

Clara H. Zillessen, advertising manager, Philadelphia Electric Co., was elected president of the Association for the 1942-1943 term, the first woman to be so honored in the twenty-year history of the P.U.A.A. Miss Zillessen was also re-elected secretary of the Advertising Federation of America which held its annual convention simultaneously.

Other officers named were: first vice-president—Thomas H. Spain, Public Service Electric & Gas Co., Newark; second vice-president—J. V. MacDonald, Boston Edison Co.; third vice-president—R. I. Seymour, Kansas City Power & Light Co.; secretary—Waldo M. Wright, Amarillo Gas Co.; treasurer—Dale Remington, Wisconsin Public Service Corp., Green Bay.

Better Copy Winners

The outstanding feature of the meeting, as formerly, was the announcement of winners in the annual Better Copy Contest by Mr. Seymour, chairman of the committee. Representatives of 61 gas, electric, water and transportation utilities from all sections of the United States received 119 awards for prize-winning advertisements. Approximately 1,400 entries were judged in the contest. A permanent record of the prize-winning advertisements reproduced in a large 68-page booklet has been distributed to P.U.A.A. members.

National awards to gas and combination companies were as follows: public relations newspaper advertising, The Cincinnati Gas & Electric Co.; gas merchandising newspaper advertising, Pacific Gas & Electric Co., San Francisco; gas load building newspaper advertising, Boston Consolidated Gas Co.; campaigns, The Connecticut Light & Power Co., Waterbury; employee magazine, Niagara Hudson Power Corp.; employee newspaper, The Cincinnati Gas & Electric Co.; residential direct mail, The Connecticut Light & Power Co.; window or inside display, Philadelphia Electric Co.; outdoor advertising, Philadelphia Electric Co.; motion pictures, Pacific Gas & Electric Company.

Of timely interest, was an exhibit of scores of gas and electric company advertisements which have appeared since Pearl Harbor. None of this material was judged in the Better Copy Contest.

The give-and-take session known as the Hell Box wherein all questions pertaining to advertising problems, griefs or accomplishments, were answered brought out much valuable information and cleared the air for the formal part of the program.

DeBard Urges War Advertising

Davis M. DeBard, vice-president, Stone & Webster Service Corp., New York, made a strong plea for continuance of public utility advertising during the war which was echoed by other speakers at the convention. Terming cessation of advertising as "deliberate sabotage" of an investment built up during normal times, Mr. DeBard said: "Any utility company which crawls into its shell and ceases to interpret itself to the public during a period of war is inviting the inevitable—serious impairment of prestige, political attack, and all the other ills associated with a policy of silence." He presented American and English answers to ten typical wartime advertising questions. In all cases, the English experience upheld American opinion that continued advertising was essential.

Charles J. Allen, director of public relations, The Connecticut Light and Power Co., Waterbury, whose advertising prowess netted two national awards in the Better Copy Contest, told the delegates how to get the most out of a small budget. His entertaining and instructive address was a highlight of the convention.

Speaking on "What Advertising Means to Selling," George Whitwell, vice-president in charge of sales, Philadelphia Electric Co., called attention to the terrific loss of sales contacts as a result of appliance restrictions and strongly urged companies to replace some of these lost contacts with advertising. "If we aren't careful, the only contact with our customers will be the monthly bill," he warned. He also referred to the wartime shifting of populations and the necessity for reaching these new customers through advertising.

An innovation in the program was the presentation of a symposium on "What We Have To Tell Mrs. America." Dr. J. Ernestine Becker, Johns Hopkins University, made an interesting talk on "Food for Fitness," which gave the fundamentals of the nutrition program. Jessie McQueen, home service counsellor, American Gas Association, described the home service activities of the gas companies and Elizabeth Murray, director, home service, Atlantic City Electric Co., told what the electric industry is doing to keep Mrs. America informed.

Keep 'Em Cooking

Give your commercial cooking customers and their employees this booklet, showing them how to keep their gas cooking equipment in good condition. In times like these, hotel and restaurant men will appreciate your help in conservation of materials and fuel.

Prices

1000 copies	$20.00
500 "	12.50
400 "	10.00
300 "	9.00
200 "	7.00
100 "	4.00
50 "	2.00
Less than 50 copies	5¢ each
Single copies	Free

Imprinting $1.00 per thousand copies. (Minimum imprinting cost $1.00)

AMERICAN GAS ASSOCIATION
420 Lexington Avenue
New York, N. Y.

Don't Worry About Dividends!

Today, as we discuss industrial problems from such grim premises, it must be apparent that industry has just one major problem to which all others are secondary. That major problem, of course, is how can industry make a maximum contribution to the war effort. Quite recently a letter was sent to the Servel stockholders, frankly informing them that we are confronted by a period of transition and conversion from refrigerator to war production, which will entail some months of subnormal operations. In response we are receiving such messages as these. From a Chicago stockholder: "Wish to compliment you on the spirit shown in placing facilities at the service of our government." From a lady in Pittsburgh: "Don't worry about dividends; just do a good job of helping to win the war." From a down East stockholder: "Whether we make a damned nickel or not, more power to you. If there isn't any country there just won't be any company." Industrial ownership has enlisted. Through the patriotic cooperation of free men and women we shall solve our problems, numerous and difficult as they are.

—Louis Ruthenburg

Personal AND OTHERWISE

E. Holley Poe Appointed Director of O. P. C. Natural Gas Division

E. Holley Poe

APPOINTMENT of E. Holley Poe as director of the newly created Natural Gas and Natural Gasoline Division of the Office of Petroleum Coordinator for War was announced June 15 by Petroleum Coordinator Harold L. Ickes.

Assistant director is Paul M. Raigorodsky, formerly assistant director of the production division and formerly with Petroleum Engineering, Inc. Others on the staff of the new division include: R. W. Ducker, formerly with the Oklahoma Natural Gas Co., chief of the natural gas section; James E. Pew, formerly with the Virginia Gasoline & Oil Co., chief of the natural gasoline section; J. Woodward Martin, formerly with the Lone Star Gas Co., and Thomas R. Weymouth, formerly with the Columbia Gas & Electric Corp.

Mr. Poe resigned as secretary of the Natural Gas Section of the American Gas Association to accept the appointment. At a luncheon held in his honor at the Engineers' Club in New York, June 15, Major Alexander Forward, managing director of the Association, paid tribute to his fine achievements as a member of the A. G. A. staff and expressed regret that the war emergency made it necessary for him to enter the larger field of government service.

Deputy Coordinator Ralph K. Davies said that the new division would "function on the same level with other operating divisions of this office."

"The division," he said, "will concern itself with all of the problems involved in the production of natural gas, the production and manufacture of natural gasoline, and the associated hydrocarbons used in the manufacture of war products.

"It must concern itself with formulating, in cooperation with the industry, plans and programs designed to assure the discovery and production of an adequate quantity of natural gas and natural gasoline. In so doing, it must be continually mindful of the need for carrying forward these activities with the minimum use of scarce materials."

Upon assuming his new post, Mr. Poe stated that every effort will be made to work with the industry in an over-all effort to assure the maintenance of adequate transportation and distribution facilities. He expressed confidence that the natural gas and natural gasoline industries "will give us full cooperation."

"Every segment of the petroleum industry is interdependent upon the others," Mr. Poe declared. "We shall do our utmost to integrate our efforts with those of the other divisions, of the Office of Petroleum Coordinator, and to cooperate with other Federal agencies that are interested in transportation and distribution problems.

"The natural gas and natural gasoline industries play an important part in the war program. They produce the essential components of such products as 100-octane aviation gasoline, synthetic rubber, and toluene."

Mr. Poe has been associated with the natural gas and natural gasoline industry for 24 years. In 1918 he joined the staff of the Tidal Oil Company (now Tidewater Oil Co.). Two years later he became associated with Tiger Mountain Oil Company, and its subsidiary, the Henryetta Gas Company, of Tulsa, where he was in charge of natural gas and natural gasoline operations. When the Henryetta Gas Company was purchased by the Central States Power and Light Company, in 1927, Mr. Poe continued with the organization in an executive capacity.

He resigned in 1937 to become secretary of the Natural Gas Section of the American Gas Association, with headquarters in New York City.

Argo Named Tampa Sales Manager

JAMES ARGO has been appointed sales manager of the Tampa Gas Company, Tampa, Fla., by A. H. Stack, president. Mr. Argo has been in charge of gas sales for the Florida Power and Light Company's Miami property since 1940. He is chairman of the Sales Committee of the Gas Meters Association of Florida-Georgia.

W. Cullen Morris Retired June 30

W. Cullen Morris

W. CULLEN MORRIS, vice-president of Consolidated Edison Company of New York, Inc., retired June 30 after serving System companies for forty-six years. He was relieved of administrative duties in December, 1940, but was retained by the company to act as a consultant on special assignments, and has served for the past year and a half as chairman of the System Defense Committee. Because of his keen interest and experience in coordinating the companies' defense activities he has signified his willingness to continue to assist the company in matters related to the war and defense situation.

Following many years of outstanding engineering work, Mr. Morris was made vice-president of the Consolidated Gas Company in 1927 and on the merger of the various gas and electric companies into the Consolidated Edison Company, he continued as vice-president. Enduring monuments to his work are the Hunts Point plant, two water gas units at Astoria, the Astoria Tunnel and the Tower of Light at Irving Place, all built under his direction.

During the past year, Mr. Morris has represented the American Gas Association on the National Technological Civil Protection Committee which was set up by the War Department to assist the Army in drafting civilian defense plans. He has rendered invaluable service in this respect and his wide experience during the first World War has been of great practical value.

Mr. Morris is the author of many engineering and technical papers and is a member of the country's leading engineering societies.

B. H. Smyers, Jr., Joins Army Air Force

B. H. SMYERS, JR., secretary-treasurer of the Pennsylvania Natural Gas Men's Association, has been granted a leave of absence for military service. A veteran of World War I and a reserve officer in the Air Corps for 15 years, Mr. Smyers has received the commission of Captain in the Army Air Corps.

Paul L. Kesel has been appointed acting secretary-treasurer in charge of financial matters for the Pennsylvania Natural Gas Men's Association. Mark Shields, executive secretary, will assume Mr. Smyers' secretarial duties.

Thomas L. Kemp (left), general manager, and D. T. Burns, assistant general manager, Citizens Gas and Coke Utility, inspecting the 100,000th gas meter in use in Indianapolis. The installation is a special glass-encased meter and is publicly displayed on the main floor of the business office to mark this milestone in the company's history

George Knight Joins Toronto Company

GEORGE M. KNIGHT, assistant manager of West Gas Improvement Co., Inc., New York, N. Y., since 1931, has been appointed engineer in charge of construction and maintenance for the Consumers' Gas Co. of Toronto, Toronto, Ontario, effective July 15.

A graduate of Manchester College of Technology in England, Mr. Knight began his career in the gas industry in 1917 when he joined West's Gas Improvement Co., Ltd., the parent organization of the New York concern. After thorough training in the design and construction of gas plants, he came to the United States in 1923. Since that time he has supervised the construction and maintenance of gas plants in many parts of this country and Canada.

Mr. and Mrs. Knight were prominent in musical circles in Westchester County where they resided.

J. K. Swanson Gets New Appointment

JOHN K. SWANSON has been appointed manager of the Vermilion Consolidated Oils Ltd., Vermilion, Alberta, and its subsidiary, the Vermilion Refinery Ltd. Mr. Swanson retains his posts as vice-president and general manager of the Northern Natural Gas Co., Ltd., of Saskatoon, and vice-president and general manager of the Franco Public Service Co., Vermilion.

Mr. Swanson was formerly vice-president and general manager of the Minneapolis Gas Light Company and a director of the American Gas Association.

Dr. Fieldner Awarded Melchett Medal

THE Melchett medal, awarded annually by the Institute of Fuel, of England, for outstanding achievement in work involving the scientific preparation or use of fuel, will be presented this year to Dr. Arno C. Fieldner, Chief of the Technologic Branch and Chief of the Coal Division, Bureau of Mines, according to advices received from the Council of the British Institute of Fuel by the Department of the Interior.

Dr. A. C. Fieldner

Dr. Fieldner, a chemical engineer and scientific research worker for 35 years in the department, thus will become the second American so honored since the medal was first awarded in 1930. Among the earlier recipients of the award are: Charles M. Schwab, of the United States; Sir John Cadman (the late Lord Cadman) of England; Dr. F. Bergius of Germany; and Mon. Etienne Audibert, of France.

The Melchett medal ordinarily is presented personally to the recipient in London, England, in October, but under present conditions, the Council of the Institute of Fuel has stated that it may arrange this year for the formal presentation to be made in the United States.

Trouble-Shooters

A NUMBER of industrial gas men are serving on the Regional War Products Advisory Committees of the American Society for Metals. The purpose of these advisory committees is to assist concerns which are working on war production contracts in overcoming metallurgical problems.

Among the industrial gas men serving as local chairmen or as problem directors are: Robert C. LeMay, The Connecticut Light & Power Co., Waterbury, Conn. (Mr. LeMay is chairman of the American Gas Association Metal Treating and Melting Committee); Stanton T. Olinger, Cincinnati Gas and Electric Co.; L. A. Zeitz, The East Ohio Gas Co.; J. C. Huston, The Bridgeport Gas Light Co.; and Lawrence R. Foote, Central Illinois Electric and Gas Co., Rockford.

Reed Succeeds Lauer as President of Philadelphia Gas Works Co.

Hudson W. Reed

ANNOUNCEMENT was made July 1 that Conrad N. Lauer has resigned as president of The Philadelphia Gas Works Company. He will remain with the company as director and chairman of the Board, and will also continue as a director and as a vice-president of The United Gas Improvement Company. Hudson W. Reed, executive vice-president of The Philadelphia Gas Works Company since March 23, 1936, was elected president to succeed Mr. Lauer.

Mr. Lauer has been a distinguished figure in the gas industry for many years and has been an outstanding leader of American Gas Association activities, heading many important committee projects. He served as president of the Association in 1938-1939 and, until May of this year, was a director for a number of years. Upon his resignation as a director, the A. G. A. Executive Board on May 4 adopted a statement calling attention to his contributions and fine character. He is also a past president of the American Society of Mechanical Engineers and a member or officer of many business, honorary, social and civic organizations.

Conrad N. Lauer

Mr. Reed entered the utility field in 1912 and for five years was with Day & Zimmermann, owners and operators of gas, electric, and traction companies. In 1917 he left Day & Zimmermann to enter the United States Army. He was commissioned a Lieutenant Colonel in the Ordnance Department and served in the production and engineering branches of that service until the end of the war.

After the armistice, Mr. Reed became a consultant on industrial engineering and management in various parts of the country. In 1931 he returned to the utility field with The United Gas Improvement Company, Philadelphia.

He is a director of the American Gas Association and is a member of the American Society of Mechanical Engineers; The Engineers' Club of Philadelphia; The University Club; The Union League of Philadelphia; and the Manufacturers Country Club.

Gauger and Todd Win A. S. T. M. Medal

A. W. Gauger

A. W. GAUGER, director, Mineral Industries Research, and F. C. Todd, assistant professor, Petroleum and Natural Gas Engineering, both of Pennsylvania State College, received the Charles B. Dudley Medal of the American Society of Testing Materials at the society's annual meeting in Atlantic City, June 24. The award was made for a joint paper presented in 1941 which describes the authors' extended work in developing a precise laboratory field method for estimating moisture in fuel gases. The investigation involved the building of special equipment and carrying out of numerous research projects.

The work of Messrs. Todd and Gauger is part of the extensive research work carried on by an A.S.T.M. Committee on Gaseous Fuels in an effort to develop satisfactory standard tests in this field. Both authors have described the results of their work before meetings of the American Gas Association.

Gas Institute Elects Board of Trustees

Frank C. Smith

THE Institute of Gas Technology, Chicago, which is embarked on a selected program of research for the gas industry held its annual meeting May 22 and elected the following Board of Trustees: Three-year term—F. M. Banks, Henry R. Cook, Jr., E. M. Farnsworth, Robert B. Harper, George S. Hawley, Marcy L. Sperry, and Paul R. Taylor. Two-year term—Frank H. Adams, Walter C. Beckjord, Thomas Drever, N. H. Gellert, N. C. McGowen, Herman Russell, and Frank C. Smith. One-year term—A. R. Bailey, W. Alton Jones, Alfred O. Kaufman, Frank H. Lerch, Jr., Clifford E. Paige, Louis Ruthenburg, and Wilfred Sykes.

Frank C. Smith, president, Houston Natural Gas Corp., is chairman of the Board of Trustees. Other officers of the Institute are: president—Dr. Henry T. Heald, president, Illinois Institute of Technology; director—Harold Vagtborg; secretary—Robert B. Harper, vice-pesident, The Peoples Gas Light & Coke Co., Chicago; treasurer—Raymond Spaeth.

In addition to the 45 utility and equipment companies in the gas industry who are members of the Institute, four additional companies have contributed up to $5,000 per year toward its work.

Appointed to Natural Gas Section Post

Honoria B. Moomaw

HONORIA B. MOOMAW has been appointed acting secretary of the Natural Gas Section of the American Gas Association, effective June 15. On that date E. Holley Poe, secretary of the Section resigned to become director of the Natural Gas and Natural Gasoline Division of the Office of Petroleum Coordinator for War.

Miss Moomaw is a graduate of Randolph-Macon Woman's College, Lynchburg, Virginia, majoring in English. Her business experience includes retail and wholesale selling and sales promotion; several years as a medical secretary, and since 1939 secretary to Mr. Poe.

Koppers Division Wins Navy "E"

THE coveted Navy "E" burgee was presented to the Koppers Company, Bartlett Hayward division, at a special ceremony in Baltimore on June 13, for the excellence and speed of the company's production of catapults for launching aircraft from navy vessels. Rear Admiral John H. Towers, U.S.N., chief of the Bureau of Aeronautics, headed a delegation of naval air officials who attended. Commander Calvin M. Bolster, U.S.N., awarded individual "E" lapel pins to the Bartlett Hayward employees.

To Curtail Noise

J. J. QUINN, general sales manager of the Boston (Mass.) Consolidated Gas Company, and Will C. Grant, advertising director of the Lone Star Gas Company, Dallas, Tex. have been named chairmen of the noise abatement committees in their respective cities. This was announced by William Reynolds, president of the National Noise Abatement Council, which is carrying on a nationwide wartime program to strengthen American health and morale, and speed up important defense production, through elimination of needless noise in homes, offices, factories and on city streets.

C. M. Cohn Honored

CHARLES M. COHN, president of the Consolidated Gas Electric Light & Power Co. of Baltimore, an alumnus of Loyola University and chairman of its Lay Council, was honored at the commencement exercises on June 7, when the honorary degree of Doctor of Laws was conferred upon him. Mr. Cohn is a director of the American Gas Association.

Miss Sweeney Advanced

ELIZABETH SWEENEY, past chairman of the Home Service Committee of the American Gas Association, has been advanced to assistant professor of household technology at Syracuse University, it was announced in June. Miss Sweeney has been an instructor in this department for several years, prior to which she was home service director of the New York State Electric and Gas Corporation, Geneva.

Shaefer Promoted

W. M. Shaefer has succeeded E. F. Kloer as director of gas utilization for the Johnstown Fuel Supply Company, Johnstown, Pa. Mr. Kloer has been appointed vice-president and general manager of the Lake Shore Gas Co., Ashtabula, Ohio.

McCarter Medals

DURING the month of June, McCarter awards were presented to William G. Wilson and Alfred Vitti, employees of the Consolidated Edison Company of New York, Inc., for their outstanding acts of life saving. Mr. Wilson received the McCarter bar and certificate which are awarded to a two-time winner of this coveted honor. Mr. Vitti was presented with a McCarter medal and certificate.

Servel Appoints Canniff Sales Manager

THE advertising office of Servel, Inc., has been transferred from New York City to the home office at Evansville, Ind., it was announced by George S. Jones, Jr., vice-president and general sales manager of the company. Coincident with this announcement, Mr. Jones made known the appointment of R. J. Canniff as advertising and sales manager, following the resignation of William Reynolds, of New York, as Servel's advertising director.

Mr. Canniff has been associated with the gas refrigerator manufacturing company as its sales promotion manager since August, 1939. He is an active representative for his company on the American Gas Association's Refrigeration Committee. He was a director on the first board of the Association of Gas Appliance and Equipment Manufacturers.

AFFILIATED ASSOCIATION *Activities*

Mid-West Gas School War Casualty

THE 1942 gas school and conference sponsored by the Mid-West Gas Association has been cancelled, according to an announcement by R. B. Searing, secretary-treasurer. This action was taken because of wartime traveling conditions and because the space ordinarily used for exhibits and meter shop work has been taken over by the U. S. Navy.

It is hoped to resume this event next year.

Canadian Gas Association

PROBLEMS of gas manufacture and distribution under wartime controls were thoroughly aired at the thirty-fifth annual meeting of the Canadian Gas Association in Montreal, June 4 and 5. Considering the critical period and transportation difficulties, the attendance and high calibre of the program were noteworthy. J. D. von Maur, distribution engineer, Consumers' Gas Co. of Toronto, headed the program committee.

The meeting opened with an address of welcome by W. J. Pead, Jr., chief engineer, Montreal Light, Heat & Power Cons., president of the Association.

Frank D. Howell, division superintendent, Dominion Natural Gas Co., Ltd., Brantford, Ont., was elected president for the new term. Other officers elected were: Alan H. Harris, Jr., Winnipeg, first vice-president; W. C. Philpot, Toronto, second vice-president. George W. Allen, who has just completed 25 years' service as secretary manager of the Association, was unanimously re-elected.

The Association's Meritorious Service Medal was presented during the annual banquet to Hector Durocher, of the Montreal Light, Heat and Power Cons., for a distinguished life-saving action. Major Alexander Forward, managing director, American Gas Association, responding to a toast to the A. G. A., spoke of the happy relationship existing between the two national gas organizations.

Among the speakers were: George S. Jones, vice-president, Servel, Inc.; H. P. Nagel, Dominion Natural Gas Co., Ltd., Buffalo; Alan H. Harris, Winnipeg Electric Co.; T. P. Pinckard, United Gas and Fuel Co., Ltd., Hamilton; J. A. Morrison, Consumers' Gas Co. of Toronto, and J. D. von Maur. Part of Mr. Nagel's remarks are included elsewhere in this issue. Mr. Pinckard, who described the tremendous job gas is doing for the armed forces, praised highly the recently published manual "War Protection of the Gas Industry," prepared by the American Gas Association.

The next annual meeting was set for Niagara Falls, Ont., June 3 and 4, 1943.

Pacific Coast Gas Association

THE high quality of the programs and the attendance at the recent series of Spring Conferences sponsored by the Pacific Coast Gas Association speak well for the vitality and morale of the Gas Industry. The Technical Conference on May 21 and 22, the Sales Conference on June 4 and 5, and the Accounting Conference on June 11 and 12 all dealt with the impact of war on the essential service of gas as felt by these various departments. Many solutions of knotty problems were presented which together told a story of courage and ingenuity we can be sure is not excelled by any other industry. The members of the Association are greatly indebted to H. P. George, J. E. Kern, L. W. Coughlan and their assistants whose labors and leadership made these conferences the useful affairs they were.

Section Chairmen for 1943 were announced at the Conferences. P. W. Walters, Southern California Gas Company, will be General Chairman of the Accounting Section; R. J. Phillips, San Diego Gas and Electric Company, will be General Chairman of the Sales and Advertising Section; and F. F. Doyle, Pacific Gas and Electric Company, will be General Chairman of the Technical Section.

The change of convention plans of the American Gas Association may make it advisable to change the date of the Pacific Coast Gas Association annual meeting, originally scheduled for September 28. While an earlier date may be chosen, the character of the meeting will remain unchanged. It will be a one-day business meeting, held primarily for the election of officers and for receiving the reports of Section and Committee Chairmen.

Maryland Utilities Association

LEWIS PAYNE, Eastern Shore Public Service Co., Salisbury, Md., was elected president of the Maryland Utilities Association at the recent annual meeting of that organization in Baltimore. C. B. Melton, Hagerstown Gas Co., was named vice-president; Douglas C. Turnbull, Jr., Consolidated Gas Electric Light & Power Co. of Baltimore, was selected as treasurer, and J. Russell Hopkins, Eastern Shore Public Service Co., was elected secretary.

Indiana Gas Association

C. V. SORENSON, Northern Indiana Public Service Co., Hammond, has been elected president of the Indiana Gas Association. Guy T. Henry, Central Indiana Gas Company, Muncie, was named vice-president and Paul A. McLeod, Public Service Co. of Indiana, Inc., Newcastle, was selected for secretary-treasurer.

Mr. Sorenson is also chairman of the Refrigeration Committee of the American Gas Association.

CONVENTION CALENDAR

OCTOBER

Oct. 5-9 **National Safety Congress and Exposition**
Chicago, Ill.

12-14 **American Society of Mechanical Engineers**
Rochester, N. Y.

NOVEMBER

Nov. 17-22 **National Chemical Exposition and National Industrial Chemical Conference**
Stevens Hotel, Chicago, Ill.

30-Dec. 1 **National Industrial Council**
Waldorf Astoria Hotel, New York, N. Y.

30-Dec. 4 **American Society of Mechanical Engineers, Annual Meeting**
New York, N. Y.

New Collection Methods to Reduce Personnel and Equipment

By HARRY S. HAHN

The Ohio Fuel Gas Company

SINCE the "Pearl Harbor" incident of December 7, there has been an outstanding change in the people of the United States and an equally outstanding change in their thinking. They have joined hands in one common cause—of winning a war.

Under the new conditions all companies are limited in their access to tires for automobile transportation of their employees. There is little chance of getting such supplies. Therefore, we can continue on our present setup only as long as rubber on hand can do the job and labor is available.

Our reasoning back of this move of eliminating personal collection service is based on a credit principle of some years' standing, to the effect that during good, prosperous times, business can radically tighten up its credit policy, while in times of depression it must liberalize that policy for best results.

Business Is Booming

Today, there is quite a change—business is "booming." That should mean the chances of prompt payment are greatly enhanced. Also, we can start our collection effort at an earlier date and do away in a large measure with the need for personal collector's service. We can justify our action for discontinuation of service as a saving program of benefit to the general defense effort.

We assumed that if the Collection Department is deprived of the use of automobiles for its field work, the substitution of bicycles, bus or street cars would slow down the work too much to serve this purpose. Also, the use of other available transportation would necessarily require an additional complement of help when little is available. Therefore, we planned to solve our problem by the entire elimination of collectors. Discontinuance of service necessitated by non-payment of bills would be placed solely in the hands of our servicemen.

Going from a personal collection service plan to a no-collector plan may be considered somewhat drastic and therefore, detrimental to public relations. This is particularly so when servicemen are used to contact customers who have not paid bills. From observation, I have found that most public utilities have trained their servicemen just as effectively in policies and customer relations' work as they have the other employees who do contact work.

Our company felt that the Service Department was just as qualified in handling the collection work as the general run of collectors would be and this confidence in our men has been substantiated. Our servicemen are not permitted to collect money except in extreme cases where there is illness, old people or some other unusual circumstance. But as a general routine, the Collection Department tries to discourage the practice of paying when the serviceman calls to disconnect service. On the other hand, if the serviceman did make a practice of collecting each month, he would be building up a clientele in the same manner that collectors formerly did.

New Changes Advertised

In order to break the news to our customers, we ran sizeable advertisements in all local papers in the territories where we operated. The advertisement set forth changes in our operating practices such as "twenty-four hour notice required for turn-on and turn-off service"; (in fact, we require twenty-four hour notice for all service except emergencies); "a one dollar charge for turn-on after disconnection for non-payment" and that "collectors having been eliminated necessitates the payment of all bills at the main or branch offices." The theme of these ads consisted of conservation of manpower, automobiles, and a general appeal for cooperation on the part of the customer. To date this cooperation and acceptance on the part of the customer has been well borne out.

According to our experience, 85% to 90% of our customers pay their gas service bills on or before the last net payment date. We also find that the 10% or 15% of the customers who do not pay by the end of the net period has been reduced to 4% or 5% before the next bills are rendered. Therefore, our Collection Department deals with approximately 5% of our customers.

What I have tried to make clear is that our public relations have not been affected adversely by the new policy because so few customers are involved.

When we began to map out the procedure for the no-collector policy we kept two things in mind—who should or should not get collection notices, and pay days. The matter of who should or should not get notices was not too difficult a problem to overcome because we had already symbolized or coded our accounts. With respect to pay days, notices must be scheduled far enough apart to allow the customer one pay day after the net payment period. We have actually been astounded by the results obtained through this delayed action in sending notices and servicemen to disconnect service.

It is only good economy to avoid collection treatment on those accounts which will be paid without follow-up and concentrate on those customers who do not pay until forced to do so. When we do this, we find that the initial, milder steps in the collection procedure show a marked decrease in effectiveness. It then becomes obvious that as far as the habitual delinquent customer is concerned, the reminder or first request for payment may as well be eliminated.

Tardy-Account Procedure

Our procedure on slow pay customers begins ten to fifteen days after the last net payment date at which time a disconnection notice is mailed to the customer, giving him forty-eight hours to pay the bill. If the bill is not paid and the customer does nothing about it, the Service Department is given an order to discontinue the service for non-payment on its next scheduled round. If the customer has the money handy, the serviceman is permitted to take it, but warns the customer that if he is required to call the following month because of non-payment he is forbidden to take the money. However, if the customer does not have the money the gas service is disconnected. Servicemen are instructed not to discontinue service where the customer is not home or where he finds sickness in the house. A charge of one dollar is made and collected in advance along with the past-due amount before the service is reconnected.

The second part of our procedure takes care of customers with good paying records or who are located in good residential neighborhoods. These accounts when past-

due are carried over to the next month as arrears. However, a reminder notice is sent to them ten to fifteen days after the last net payment date, and following that, sticker notices are placed on the next bill again reminding the customers of the past-due amounts. Where the second month's bill, including the previous month's past-due balance falls in arrears without any explanation from the customer, he should, of course, receive a disconnect notice not less than fifteen days after the last net payment date. If the customer does nothing about it within forty-eight hours after receipt of the notice, he will likely be without service until the bill is paid.

Some might think such treatment is rather drastic. But we think not, since the customer will have had three full months' use of gas and the service will be disconnected solely because of his complete failure to heed our warning. If a customer discovers that he can let his bill drag on without any trouble except that the collector calls every few days, he develops an attitude of carelessness which is not essentially one of his characteristics. Why shouldn't we then devise defensible collection policies? The customer, even though delinquent, is an essential part of our business. On the other hand, our company and its services are essential to the comfort of our customers. Therefore, we do not hesitate to advise the A, B and C customers of our intentions after they have received not less than four notices—two service bills and two reminder notices.

The third part of our collection procedure pertains to the collection of past-due final bills. Since we have dispensed with collectors and must rely on mailed notices, we use a series of collection letters that have proved effective. After running the gamut of this series of letters we forward the residue of accounts to a local collection agency. We have dealt with this agency for years and have gotten excellent results.

In conclusion, we find after several months that in spite of the elimination of thirty collectors and twenty automobiles the amounts outstanding have not increased but actually decreased. We have saved some money and apparently are retaining public good will. Yes, the plan works—the substitution of mailed notices and servicemen for a full staff of collectors and a fleet of automobiles.

No A.G.A. Membership List This Year

PUBLICATION of the Membership List of the American Gas Association has been postponed for the duration of the war. Ordinarily a new list appears at intervals of not more than two years but frequent personnel changes as a result of the war make publication of a new membership list impractical. The last list was published in 1941.

Change to Bi-Monthly Meter Readings

TO conserve materials and man power, The Consumers Power Company instituted a system of bi-monthly reading of gas and electric meters on June 1.

Meters to be read every two months, instead of once a month as heretofore, include all residential and certain commercial meters. The new plan does not apply generally to industrial customers.

Half the meters involved in the plan will be read in June, half in July. After the June or July reading there will be a two-months interval before the meter is read again.

Bills will be rendered monthly, as previously, and in the month that the meter is not read the bill ordinarily will be one-half the bill computed for the previous two months. When the meter is read again (for a two-months' period) the several blocks of the rate schedule will be applied on a two-months' basis. Since the meter reading will be taken after two months of service, the amount billed for the first month will be deducted therefrom. The balance will be the bill for the second month. Thus bills will be adjusted to meter exactness every other month.

Foster Elected

GLEN E. FOSTER, comptroller, The Brooklyn Union Gas Company, was elected president of the New York City Control of The Controllers' Institute of America at the annual meeting of the Control June 18.

Pay Gas Bill at Super Market

COOPERATING in the government's plan to conserve tires and gasoline, the United Gas Corporation has made arrangements with two large chain stores to accept payment for monthly gas service bills. Cashiers are now stationed at 30 super markets in Houston, Texas, for this purpose.

Weather Statistics Being Studied

THE National District Heating Association has organized a committee, on which the American Gas Association is represented by Raymond Little, Equitable Gas Co., Pittsburgh, to investigate weather statistics. Also working on the committee are delegates of American Society of Heating and Ventilating Engineers, National Warm Air Heating Association, Oil Burner Institute, U. S. Weather Bureau, and the National District Heating Association.

Major problems to be considered are (1) standardizing methods of computing current and normal degree-days, (2) bringing the record of normal degree-days up to date, and (3) movement of instruments and correlation of stations, as well as a number of problems of minor importance in the gathering of degree day and other weather statistics.

There are other groups at work on the general subject of weather statistics. Professors Konzo and Kratz of the University of Illinois, who are also fuel consultants for the Army Corps of Engineers, are working on statistics that will help rationalize the basis for estimating fuel requirements. Professor Konzo is a member of the committee organized by the National District Heating Association.

McCall's Contest Closes Aug. 1

GAS utility home service departments competing for the second annual awards in the *McCall's Magazine* Contest must submit their papers to American Gas Association headquarters on or before August 1, 1942.

Cash prizes of $100, $50 and $25, with plaque or certificates will be made to the three home service directors or directing heads of the home service departments of those gas companies in the United States and Canada which have, in the judgment of the Jury of Awards, made the most outstanding contributions to the advancement of better living in the home.

The basis on which the awards will be made are as follows:

Entrants will submit papers of 2000 words or less covering the following five heads:

1. The aim of the particular Home Service Department. (Rating—15 points.)
2. The training of personnel and sales people. (Rating—15 points.)
3. Community activities engaged in by the Home Service Department. (Rating—20 points.)
4. Any increase in scope of Home Service activities in the current year over the preceding year. (Rating—25 points.)
5. Accomplishment of aims. (Rating—25 points.)

The awards will be announced in October 1942 for the calendar year of 1941.

Entries should be addressed to *McCall's Magazine* Awards, care of the American Gas Association, 420 Lexington Avenue, New York, New York.

War Bond Support

EMPLOYEES of the Kansas City Gas Company, Kansas City, Mo., are rallying wholeheartedly behind the country's war effort. Already more than 98 per cent of the company's employees have enrolled in the War Bond payroll allotment plan, Major T. J. Strickler, vice-president, announced recently. The company was complimented upon its record by Dan M. Nee, state administrator of the Treasury Department's War Savings staff.

Mid-Western Companies Gear Home Service Activities to Victory Program

By JESSIE MCQUEEN

Home Service Counsellor, American Gas Association

HOME service directors from gas companies in nine Mid-Western states met in a two-day roundtable conference in Chicago, May 15 and 16. Developing the theme "Home Service in Wartime," the conference started auspiciously with a surprise visit from Dr. Helen Mitchell, principal nutritionist of the Office of Defense Health and Welfare Services of the Federal Security Agency in Washington. Dr. Mitchell again emphasized what she had said in an article in the April issue of the A. G. A. MONTHLY, i.e. that "home service people have the experience and ability to show people how to use food and they have already rendered valuable service in the Nutrition Program as instructors, consultants and organizers."

As third in our wartime series of A. G. A. MONTHLY home service activities, (March —New England; May—Pacific Coast) we can report from this meeting that the Mid-West is way out in front in gearing its regular home service work to the wartime picture.

Jeannette Campbell, Minneapolis Gas Light Company, as chairman of Home Service in the Mid-West Conference, presided and called upon representatives of each department in attendance to outline work under way. A brief description of these activities follow:

The Home Volunteer Program of Servel, Inc.

The Home Volunteer Program of Servel, Inc., has had immediate acceptance in many Mid-West companies and has provided a gold mine of assistance to gas companies.* It is especially significant that such a recognized nutrition authority as J. Ernestine Becker of Johns Hopkins University was chosen to head the advisory work. The whole program has been checked and approved by the Washington agencies which head the National Nutrition Program. Gas companies and their home service departments particularly, greatly appreciate the fore-sightedness of the Servel executives who have set up their contributing program as an expression of appreciation for the fine support the gas companies have given their product. Frances Cowing and A. V. Monahan of Servel, Inc. were present at the conference to outline the details of the operation of the Home Volunteer Program.

Minneapolis Gas Light Co., Minneapolis, Minn., Jeannette Campbell, Home Service Director.

This program leads off with Red Cross nutrition classes and demonstrations. The regular staff of the home service department gives one half of the demonstrations for all of the Red Cross classes being taught in Minneapolis and surburban areas. Theatre schools are held four days a week at neighborhood theatres, each day at a different location. 32,254 people were reached through the theatre schools this year with sixteen different theatres in use.

The Minneapolis company has always been known for its interesting sales floor activities. Currently a red, white and blue sign entitled "$ome $ugar $avers," heads a display of five cakes made with sugar alternates. The new recipes adapted from

* For a description of the program see A. G. A. MONTHLY, May, 1942, pp. 179.

Nutrition center on the sales floor of the Minneapolis Gas Light Company

The gas company sales floor in Muskegon, Michigan, provides a good setting for a community nutrition information center. It is sponsored jointly by the Office of Civilian Defense, the Red Cross and the Nutrition Committee. Three members of the home service department are on the County Nutrition Committee and wear Red Cross uniforms while on duty in the center

In Detroit, the triangular display windows across the full corner of the gas company building afford excellent opportunity for spectacular exhibits cooperating with the National Nutrition Program

This is the third in a series of articles on wartime home service activities. A fourth article describing activities of Southern gas companies will appear in an early issue.

old well-known ones were typed on cardboard with a red binding around the edge to form a frame. These were set up on standards with paper and pencil provided for copying and it created tremendous interest.

Northern Indiana Public Service Co., South Bend, Ind., Martha Hocker, Home Service Director.

The office of Civilian Defense in South Bend inaugurated Nutrition Week in April as a week in which to stimulate public interest in a balanced nutrition program. South Bend was set up as a test city with full cooperation of the Office of Defense Health and Welfare Services under the personal supervision of Dr. W. H. Sebrell, Associate Director of Nutrition. Miss Hocker was chairman of the Publicity Committee.

The program of the week included meetings with national figures in attendance, display of films, particularly the federal one entitled "Hidden Hunger"; broadcast interviews every day, Monday through Saturday; and spot announcements during each day's schedule. A great deal of space was contributed by the local newspaper for publicity and advertising. 162,000 pieces of literature were distributed throughout the nearby area with the aid of the Red Cross Motor Corps who distributed literature and posters and the Camp Fire Girls who distributed posters to individual stores. Large exhibits appeared throughout the city and newsreel companies were on hand. A test case in which the gas company in its loan of Miss Hocker for much time in connection with the Publicity Committee and as a member of the Exhibit Committee, contributed a sizeable part in the week's program. A window display set up by the Company is shown in an accompanying picture.

Central Illinois Electric and Gas Co., Rockford, Ill., Blanche Kerr, Home Service Director.

As chairman of the Canteen Corps of the Red Cross, Miss Kerr is automatically in charge of all emergency feeding for civilian defense. From the women who have been enrolled in the nutrition classes apart from the canteen work come reports of results

Right—Classes for Girl Scouts at the Central Illinois Electric and Gas Co., Rockford, have provided the fundamental training for wartime Canteen Service in the Girl Scout "Blitz Brigade"

Below—The Girl Scout Cookie Jar is popular at the Service Men's Club in Rockford

from their first classes—weight increases for underweight and nervous war workers, improved dispositions and altered food habits. Many individual class members keep interesting notebooks, and other classes have worked up Nutrition Posters which they have presented to the Red Cross for use in the Nutrition Center.

Girl Scouts

In the summer of 1941, classes were conducted for Girl Scouts, based on the nutrition yardstick. Before any scout could pass the course and receive her Food and Cook's badges, she had to prepare a full day's meal for her family. This timing was opportune because, by Fall, many of those girls were doing all the marketing and cooking for their families, as both parents were employed in the war industries.

Another development—the Girl Scout Cookie Jar—was started on July 4, 1941. Girl Scout troops take turns every week contributing 120 dozen cookies every Saturday morning for the Service Club—the cookies and the girls in charge providing a popular feature with the boys in the armed services. The utility company sponsored the plan and the home service department set up the cookie recipes but the scouts now keep it up. The sugar rationing board has made special allowances for sugar to be used in the cookies for the Service Men's Cookie Jar.

The Girl Scout *"Blitz Brigade"* is restricted to selected girls—those who have shown aptitude for this work in the cookery classes, and who have a sense of responsibility. The same training is to be given to Senior Girl Scouts to enable them to qualify as Senior Service Scouts in the Civilian Defense program. A complete outline of organization which indicates the purpose and operation has been abstracted as follows:

GIRL SCOUT "BLITZ BRIGADE"

Purpose: The formation of a group of selected Girl Scouts to be prepared to serve soup or coffee to masses of people in time of emergency. Because Girl Scouts are used to operating in a disciplined and co-ordinated manner this group can offer valuable service, either alone, or in conjunction with the Red Cross Canteen Corps.

Place in Defense: Registration of the brigade with the Office of Civilian Defense and with the Red Cross.

Good food, properly cooked, was the predominant theme of the Kansas City Gas Company's exhibit at the Victory Food Fair

KANSAS CITY GAS COMPANY
HELP MAKE AMERICA STRONG
KANSAS CITY GAS COMPANY
THROUGH PROPERLY COOKED FOODS
IN THE FRONT LINE OF HOME DEFENSE!
GAS

A radio program in a gas-equipped kitchen uses the nutrition theme for its twice-a-week broadcasts by Mary L. Dilley, Central Illinois Light Co., Springfield

Organization

The *"Blitz Brigade"* to be divided into four squads (one for each quarter of the city, with additional squads organized as needed). An adult is in charge. Members of squads must be within reasonably close walking distance of each other, so that personal contact may be established if telephone service fails. Squad members must have easy access to bus service.

Operation

Girls must secure parents' written permission to volunteer for service.

The following equipment must be held in readiness by each girl for emergency use at all times—this to be guaranteed by constant inspection of squads and individuals, and by simulated emergency conditions.

1. For making and serving hot coffee (listed in detail).
2. For making and serving hot soup.
3. For starting a cooking fire.

Michigan Consolidated Gas Co., Detroit, Mich., Irene Hickey, Home Service Director.

This is another company which has gone all out for nutrition classes. Under the supervision of the city librarian an exhibit of reference material on nutrition was made available in the gas company and left on display for two weeks for reference by members of the various nutrition classes. It was popular also with visitors at the home service auditorium.

At the City Flower Show, the gas company cooperated with the Wayne County Nutrition Committee in setting up a sixty-five foot display space on nutrition material and oven canning and it was awarded the Blue Rosette! This Nutrition Booth was then displayed at the Community Home Defense Program at the Hyland Park High School where it was seen by approximately five thousand people. Later it was moved to the Tau Beta Community House for another week's display.

Girl Scouts and Camp Fire Girls receive an active welcome from the home service department in Detroit. For a number of years Miss Hickey has been a member of the Detroit Camp Fire Girls, acting as chairman of the Committee on Awards. Miss Hickey works with the local director in placing camp orders to be sure that the foods selected tie in with the nutrition yardstick.

Rosemary Lodde, Indiana University dietician, explaining a nutrition chart during a canteen course in Indianapolis, Marian E. Schleicher (seated), home service director, is assisting

Radio

For the third year the "Homemakers Quiz" has been a feature of the gas company radio program. An interesting project in this connection is that involving the loan of wedding cake pans. Three sets are in constant use with recipes scaled exactly for amounts to use in the twenty-pound cakes made in three graduated pans for tiered wedding cakes.

In the gas company's new building there is an effective window display with the entire corner an open window. Since the Nutrition Program became a victory symbol, the Advertising Department has used nutrition as its theme, cooperating with home service in displays of foods and recipes.

The Home Volunteer Program of Servel, Inc.; food preservation; theatre cooking schools and extensive cooperation with WPA in instructing women as maids, have been active parts of the program carried on. In the gas company series of four model kitchens to be used in connection with kitchen planning activities, classes from Wayne University; local high schools; intermediate schools and Ford's Home Art Classes are coming in regularly to the company for illustrated talks on kitchen planning.

Central Illinois Light Co., Springfield, Ill., Mary L. Dilley, Home Service Director.

An important part of the home service program in Springfield is the twice weekly radio broadcast. A completely equipped gas kitchen has been set up in the large studio of WCBS with a studio audience of 170 at each class. Through the Surplus Marketing Administration, a "Food of the Week" project is tested first in Springfield with representatives from nationally known food associations cooperating with local groups and presenting interesting talks from chefs from local restaurants and hotels.

Through the Illinois State Council of Defense, the chief home economist, Mrs. Christine Pensinger, appears quite regularly on the Springfield broadcasts discussing current food material and giving food information which Governor Green wishes presented to the home makers of Illinois. A recent guest was a Mess and Supply Officer from a nearby air force depot group who discussed army food planning and in the interview with

Nutrition Week in South Bend was a national "proving ground" in promoting the nutrition program. This display was featured in the window of the Northern Indiana Public Service Company

the station announcer and Miss Dilley, outlined the details of one phase of food preparation and feeding in the army.

Michigan Consolidated Gas Co., Muskegon, Mich., Martha Bradley, Home Service Director.

A Nutrition Center appears on the sales floor of this company sponsored by the Office of Civilian Defense, American Red Cross and the Nutrition Committee. The advertisement which appeared in the local newspapers announcing the opening of the center was signed by those organizations. In a company serving 16,000 meters, three home service directors are continuing a full nutrition program and carrying on Red Cross Nutrition and Canteen Classes. Three members of the home service department are on the county nutrition committee and wear Red Cross uniforms on duty in the Nutrition Center. Requests from hotels and restaurants keep coming in for special menus and charts to use on restaurant tables.

Milwaukee Gas Light Co., Milwaukee, Wis., Mrs. Ella Liner Lambert, Home Service Director.

The Nutrition Committee of the Health and Welfare section of the Milwaukee Health Council sponsored a Nutrition Day on May 1. Mothers of children in every school in Milwaukee were invited to the program in the auditorium of the Milwaukee Gas Light Company. This committee also set up a nutrition booth at the auditorium during the War Exposition June 10. Mrs. Lambert acted as Consumers' Sub-Chairman of the Nutrition Committee of the Defense Council and is a member of the women's division of the Consumers' Committee of the O.P.A. which has set up a lecture bureau and conservation centers. Weekly newspaper articles on some phase of nutrition are written by Mrs. Lambert for the *Milwaukee Post*.

At the home service conference, Mrs. Lambert on request outlined the courses of study as they had been given in the Refresher Courses at the University of Wisconsin for the home service departments in the Wisconsin companies.

Kansas City Gas Co., Kansas City, Mo., Colleen Fowler, Home Service Director.

The gas company in this area is well known for its early promotion of weekly low-cost menus set up in printed form covering food ranging in cost from 75¢ to $1.50 for a family of five—one a preschool child. These menus are distributed through the gas company and also have wide grocery distribution.

Many school teachers have asked for recipes to be used in food classes and students have sent in the information that recipes have been checked and tested for cost and nutrition value as part of their instruction. Libraries, institutions and hospitals all receive these menus—available to them through Civilian Defense.

A Victory Menu Contest was set up as a part of the exhibit of the gas company in connection with the Victory Food Fair in the Municipal Auditorium. The first prize was a $25 War Bond and ten other prizes were varying amounts in War Stamps. Prizes were awarded to contestants submitting the best-balanced menus for one week.

The Gas Service Co., Kansas City, Mo.

Represented by Ada Schroeder, Joplin, Missouri; Betty Boyle, Kansas City, Kansas; Jewel Hensley, Topeka, Kansas; Dorothy Klaner, Merriam, Kansas.

The Gas Service Company, through properties in Missouri, Kansas and Oklahoma, reports a similar program of instruction and demonstrations to a large number of customers with greatly diversified interests. Customer literature set up includes a folder entitled "Keep Your Family Strong" and this has been supplemented by excellent company advertising, participation in Fairs, and exhibits and displays of posters in the different company windows.

Nutrition Booths have been particularly successful and in many instances have been established as nutrition headquarters for the local community. To keep up the interest in the nutrition classes the Joplin, Mo., Nutrition Committee authorized the use of a diploma given after the completion of a six-lesson course in Modern Nutrition under the Joplin Nutrition Civilian Defense Volunteer Committee, which pledges the recipient to do her part in the "Defense Program" by feeding her family with properly prepared foods and nourishing meals.

Citizens Gas and Coke Utility, Indianapolis, Ind., Marian E. Schleicher, Home Service Director.

Work under way in Indianapolis includes: cooking schools each Tuesday; Camp Fire, Girl Scout and C.Y.O. classes; cooperation with city schools in beginning summer 4-H club work; colored nutrition and cooking classes held at the colored Community Center; Teaching of Red Cross nutrition and canteen classes in the Home Service auditorium;—3 days per week of nutrition classes; 2 days per week of canteen classes; 1 night nutrition and canteen class for business women; also a column on food and nutrition each month in the employees' house organ; maintenance of nutrition bulletin board on sales floor; 4 day canning school in July—one day will be spent in each section of the city and the demonstrations will be in community houses; food shelf of foods and recipes located on the sales floor.

Wisconsin Public Service Corp., Green Bay, Wis., Miss Kathryn Heffernen, Home Service Director.

Girl scout activities are prominent in the Home Service work of this department with nutrition and food preparation, of course, paramount. Girl Scouts are urged to keep the Home Safety record perfect and to use the money ordinarily spent on doctor's bills to buy War Bonds and Stamps.

The usual contact with P.T.A. groups has been continued with active interest in the new story on nutrition. Canning displays have been made up and are being shown throughout the various properties; and the well-known Theater Classes are being continued.

(Continued on page 288)

N.Y.-N.J. Gas Sales Managers Meet

A LIVELY round-table forum of sales managers of New York and New Jersey gas companies was held June 26 at the Hotel Pennsylvania, New York, N. Y., under the sponsorship of the Residential Section of the American Gas Association. W. E. Bolte, new business manager, The Brooklyn Union Gas Co., and chairman of the New York-New Jersey Regional Gas Sales Council, presided at the meeting.

Outstanding among the topics discussed were: governmental controls and their effect on appliance sales; utilization of sales personnel; post-war planning and competition; servicing policies; advertising themes; and appliance research. The conference went on record as recommending the immediate inauguration of a national appliance research program, particularly on gas ranges and water heaters.

A. H. Palmatier, general sales manager, Rockland Light & Power Co., Nyack, was elected chairman of the sales council for 1942-1943. An executive committee was appointed consisting of retiring Chairman Bolte, W. S. Potter, vice-president, Elizabethtown Consolidated Gas Co., Elizabeth, and James P. Hanlan, sales manager, Public Service Electric & Gas Company, Newark.

Feature speaker of the morning session was Henry M. Brundage, chief, Appliance Section, Plumbing and Heating Branch, War Production Board, Washington, D. C., who gave a complete explanation of the priority system and the limitation orders. Following a discussion of these governmental controls, various phases of the gas industry's sales and personnel problems were discussed under the following forum leaders: F. M. Houston, Rochester Gas & Electric Corp.; R. E. Williams, Binghamton Gas Works; B. A. Seiple, Jersey Central Power & Light Co., and W. S. Potter, Elizabethtown Consolidated Gas Company.

Industrial and Commercial Gas Equipment—Outlook for the Duration

By KARL EMMERLING

The East Ohio Gas Company, Cleveland, Ohio

THE title of this paper seems to cast me in the role of a fortune teller, for changes are coming so rapidly that any attempt to forecast is pure guesswork. Nevertheless, a working chart of some kind is a necessity, in spite of the limitations and uncertainties which would affect it. We can at least start with the fact that as yet it is not too difficult for companies who need gas equipment for war production to obtain what they need to fill requirements, if they can wait a sufficient length of time.

Manufacturers of industrial furnaces are overloaded and are suffering from all the troubles that beset industry in general, but in spite of all this, they are turning out a tremendous amount of equipment, and so far seem to have kept fairly well abreast of the demands of industry. Whether or not they can keep this up is another matter.

Shortage of Alloys

Modern heat-treating furnaces require large amounts of heat-resisting alloys. Nickel and chromium, without which heat-resisting metals cannot be made, are on the scarce list. Judging from the curtailment in the manufacture of electrical equipment that requires heating elements, a really serious shortage of these materials is impending. How far such a shortage is going to affect the supply of industrial gas furnaces is hard to say. Certainly it may radically change their design.

Fire brick and insulating brick manufacturers are working to capacity and deliveries are slow. With the ever expanding demand for refractory materials, not alone by industrial furnace builders but also by the steel industry, for new coke ovens and blast furnaces, it is *inevitably* going to be *increasingly difficult* to obtain these materials.

The supply of other equipment used on industrial furnaces will be curtailed or delayed, for many reasons, all of which you know about.

As a result, it will probably become increasingly difficult to obtain industrial equipment, unless one has the very best of priorities, with a result that many of the industries whose product is secondary to the war effort may not be able to obtain the gas equipment that they need.

Presented at Natural Gas Section Convention, New Orleans, La., May 4-7, 1942.

This condition gives the industrial gas man of ingenuity and skill an opportunity to be of great help to industrial customers who need additional furnace equipment in a hurry, or who cannot get equipment on account of a poor priority.

Here are some of the things that he can do:

There may be idle, discarded, or obsolete equipment in a plant somewhere in the industrial man's territory, that will suit or can be adapted to his customer's needs. The experienced industrial gas man has a wealth of this information in his head, and he also has the knowledge of men and of places that can enable him to run down and locate any such equipment. If a transfer of the equipment can be arranged, the customer, the war effort, and the gas company all have been helped.

Sometimes a customer has an old furnace shell or other parts that, with a little ingenuity and material, can be developed into a usable unit. The help and experience of the industrial gas man can do much here.

Associations' War Work

Another helpful and tangible fact in this situation is the organization and integration of all such individual experience and knowledge through industrial associations. A conspicuous example of this activity is the American Society for Metals which has organized War Products Advisory Committees in every one of its chapters. Their job is to aid and advise manufacturers on heat-treating and other metallurgical processes that they need to know about in order to take on war work. They try to find war work for idle plants and equipment, and to aid in all ways possible in the change-over from civilian to military production.

Often an industrial gas man is a member of this committee, and if he is not, he should be, for he will have more knowledge of the capacities of the various manufacturers in his district and the equipment available than almost anyone else in the territory covered by him.

Here are a few examples of what has been done:

1. A manufacturer of vitreous enamelled sheet metal products is now making demolition bombs. The War Products Advisory Committee helped him develop his heating and heat-treating operations.
2. Another vitreous enameller has been shown how to heat-treat armor plate, and has received an order for this work.
3. Brass melting is now being tried out in enamel frit smelting furnaces.

It is well worth while for every industrial gas department to have a member on these committees, not only for the benefit that he can be to his customers, but also for the good will he can develop for his company.

Industrial Engineer as Builder

The time may soon come where the only way in which a customer can obtain the industrial equipment he needs is by building it himself, with what material he has on hand, plus that which he is able to buy, and here again the industrial man can help. His experience in furnace design, burner application, and combustion will be invaluable to the customer, particularly those customers whose operations are not large enough to warrant the employment of an experienced fuel engineer.

I know that this is a reversal of the trend of the past ten or fifteen years. During this period, and rightly so, the industrial gas engineers have been depending upon the industrial furnace builders to supply the gas equipment to fill their customers' needs and have stopped encouraging the construction of homemade equipment. For the duration, it may be necessary to go back to what was rather common practice years ago, and one in which I indulged a good deal myself.

I suppose almost every gas company which has an active industrial department has in stock somewhere burners and odds and ends of various industrial gas equipment which can be put at the disposal of industrial gas customers and which may fill urgent needs. Every industrial gas man should ransack his company's stockrooms for such surplus or unnecessary equipment, and see to it that it is put into use.

There never has been a time when it has been more necessary to maintain industrial gas equipment at its most efficient operating level, and when shutdowns have been more costly. Reduced production means delayed

deliveries, and delayed deliveries may well mean a torpedoed ship or a lost battle.

It therefore behooves every user of industrial heating equipment to treat it with the best of care, and to maintain it at its highest operating level. It seems to me that it is part of the duty of every industrial gas engineer to see to it that the users of industrial gas in his district receive proper instruction as to how to best operate and maintain their gas equipment. Here are a few of the precautions that can be taken to increase the life of an industrial gas furnace:

1. Heat furnaces up slowly.
2. Cool furnaces down slowly.
   There is nothing that will ruin brickwork faster than fast heating up or cooling down. Plenty of time should be allowed for both of these operations.
3. Patch cracks in brickwork as they are noticed.
   Small cracks that are patched in time may save a major brick-laying job a week later.
4. Prevent, as far as possible, flame impingement on metal parts of the furnace, such as door frames, buck staves, etc. Warpage and buckling of metal parts impart undue strain on the brickwork, which sometimes results in the collapse of part or all of it.
5. Do not overload conveyors.
   One of the commonest reasons for delay is broken conveyors, and overloading is what generally causes the break.
6. Do not overheat furnaces, particularly those equipped with heat resisting alloy parts.
   Furnaces are usually designed for certain temperatures, and gross overheating may damage the linings. The same is true of alloys used, and heat resisting alloys are becoming difficult to obtain; therefore, care in their use is vital.
7. Keep all control equipment properly oiled, adjusted, and scrupulously clean.
   This equipment is delicate and gets out of order easily. In these days of exacting heating requirements, an inaccurate pyrometer may pile up rejections rapidly.
8. Be careful in lighting up.
   Explosions due to delayed ignition do the brickwork no good.

Many natural gas companies are going to have trouble this winter supplying all the gas that our industries require, and conservation of natural gas is going to be preached from several pulpits. In many territories natural gas has been so low in price that the savings developed by installing more efficient equipment or processes would not pay for the changes in a reasonable period of time. Consequently there are still many places where natural gas is used wastefully.

Time to Stop Waste

Now is the time when it may be possible for the industrial gas man to have some of these wasteful practices stopped; not so much for the saving in money that will result to the customer, but because more continuous service to war industry may be possible next winter by reason of such saving, and because it is patriotic to use gas wisely.

Conservation does not always require the expenditure of large sums of money. It is often accomplished by proper training of operators, application of insulating materials, use of automatic controls, minor changes in furnace construction, and in various other ways. Here again the industrial gas engineer can be of real help; he knows more about methods of reducing gas consumption than most of his customers, and it is part of his job not only to tell his customers about such methods but also to sell the idea of getting them adopted.

At the present writing L-79 has stopped the sale of commercial gas cooking, baking and counter equipment except to those who have or can obtain a priority.

With their stoppage, the commercial gas man will have to help those customers who need to locate usable secondhand equipment. This should not be to difficult a problem as far as restaurants are concerned. A good many suburban and country eating places will close, as the tire shortage stops the use of automobiles. Many of these establishments use gas, are of fairly recent construction, and should provide a fairly large source of usable secondhand cooking equipment.

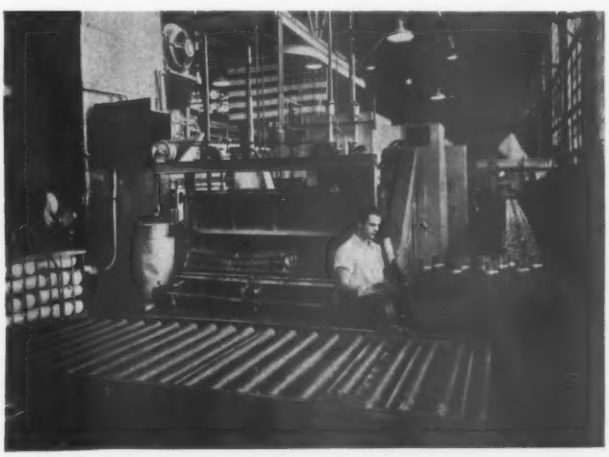
There will remain for our commercial departments the obligation to help our customers keep their present equipment in such condition that replacement will not be necessary. Moreover, large equipment manufacturers probably will not keep their present dealer contacts, and hence our dealers will not continue calling on customers to whom they have no prospects of selling any equipment. Yet, the history of the last war proves that unless the seller of a service or a line of merchandise maintains customer contacts during the war, his service or merchandise, no matter how prominent it now is, may be forgotten by the time the war is over. We can expect, also, that many of our present equipment manufacturers will be out of existence at the end of the war.

Make Lasting Friends Now

If there ever was a time when a gas company can make lasting friends out of its industrial and commercial customers, it is the present. Those gas company sales departments—yes, and service departments, too—that can relieve the industrial and commercial gas users of some of the troubles and worries which nowadays surround the obtaining, construction, and maintenance of gas equipment, are going to find the going very much easier when competition comes back—and don't think for a minute that it won't.

Bear this in mind—that every time one of us is helping one of our customers to:

A clean hardening furnace helps out with war production



Low temperature cartridge annealing furnace in Ohio

(a) provide himself with a useful piece of gas equipment that did not have to be produced at the expense of other war material;
(b) speed up the construction of an essential furnace;
(c) increase the production on an existing furnace;
(d) bring an idle piece of gas equipment into use;
(e) and last, but not least, improve the operation or construction of a piece of equipment, so that gas is saved,

he is helping win the war.

★ Gas at Work ★
ON THE
WAR PRODUCTION FRONT

New York's Machine and Metal Trade High School has 75 gas heat-treating furnaces for instruction purposes for war plant workers. Are the school shops in your city properly gas equipped?

◆

Over 14,000 chain-store fountains and fountain restaurants do a $470,000,000 yearly business—much of which represents food prepared on the spot.

◆

American manufacturers are building more tanks in one month of 1942 than during all of World War I.

◆

One Naval Ordnance plant has an installation of eighty 1,000,000 B.t.u. gas-fired floor type heaters.

◆

Potteries that use gas are busy making ware for camps, bases, and ships. Kilns in other ceramic plants are being altered for heat treating heavy war metals.

◆

Industrial heating furnace sales increased from $16,475,000 in 1937 to some $60,000,000 in 1941. And still going up!

◆

Restaurant food sales are running over 15% ahead of last year, with nearly 20,000,000 served daily. Gas is helping not only to cook the food but to make part of it in the food factories, packing houses, and bakeries before it reaches the restaurants.

◆

Women war workers are doing a good job operating many types of gas furnaces in war production plants.

◆

Converting gas enameling furnaces and ceramic tunnel kilns to large-scale annealing and heat treating, as requested by Army and Navy Munitions Board, presents some tough problems—but these are gradually being overcome in a number of plants.

The National Nutritional Program benefits are being carried direct to war workers through intensive application in war production plants. Gas factory cafeterias are preparing fine nutritional food.

◆

5,000,000 cartridge clips in 24 hours are being turned out in single industrial gas furnaces.

◆

Gas and Hens Team Up for Victory. Of the nearly four billion powdered eggs shipped to England last year to help sustain British brawn, many were dried with gas.

◆

Have you furnished your commercial customers with "Keep 'Em Cooking?" This pamphlet was designed to help keep kitchen equipment operating through the war. You can get it in quantity from A. G. A. Headquarters.

◆

Fuel for thought—Selecting Oven-type Heat Treating Furnaces, MACHINERY, May, p. 130; June, p. 155; Heat Treating Cuts Cost by Automatic Spray Pickling, STEEL, May 25, p. 78; New Lease of Life for Wearing Parts by Gas Welding, POWER, June, p. 84.

Gas Men Speak

FEATURED speakers at a technical sessions on fuels held by the American Society of Mechanical Engineers at the Hotel Statler, June 8-10, were two gas-industry representatives, Dr. F. E. Vandaveer, A. G. A. Testing Laboratories, and Lee Wilson, Lee Wilson Engineering Co., both of Cleveland.

Dr. Vandaveer brought "Recent Advances in Gas Utilization" up to date. Subject of Mr. Wilson's discussion was "Radiant Tube Furnaces" and their extensive use in war production.

Willard F. Suess Dies

WILLARD F. SUESS, a member of the 1942 Gas Engine Power Committee of the A. G. A. Industrial and Commercial Gas Section, recently passed away.

Mr. Suess, general supervisor of gas power sales, Southern California Gas Co., Los Angeles, became associated with the gas industry when he joined that company in 1923. In 1928 he was made division sales supervisor for San Bernardino, and in 1933 was promoted to power engineer in Los Angeles. In 1935 he was advanced to the position he held at the time of his death.

INDUSTRIAL AND COMMERCIAL GAS ADVERTISING FOR JULY

The National Advertising Committee of the Industrial and Commercial Gas Section, J. P. Leinroth, chairman, and F. B. Jones, vice-chairman, announces that full-page advertisements will appear in the trade and business magazines listed below during the month of July. These advertisements, which will appear in 16 publications reaching a total audience of 288,587, are prepared in cooperation with the Committee on National Advertising as a part of the Association's national advertising campaign.

General Manufacturing

BUSINESS WEEK (July 25)—Can we help *you*, too . . . to speed output, conserve fuel, make the most of present *GAS* equipment?

Metals Industry

THE IRON AGE (July 9)—The Problem: More Guns—in a hurry! And *GAS* provides an answer with doubled, tripled production!
STEEL (July 20)
METALS & ALLOYS
INDUSTRIAL HEATING
HEAT TREATING & FORGING

Baking Field

BAKERS HELPER (July 4)—*Gas*—baked goods aplenty for our armed forces.

Ceramic Industry

CERAMIC INDUSTRY—Substitutions . . . the new challenge to ceramics and *GAS* engineering.

Hotel and Restaurant Field

AMERICAN RESTAURANT—The "Military" *cooks with GAS!*
CHAIN STORE AGE (Fountain and Restaurant Section)—Keep 'em shipshape! They get the utmost from *GAS* in the Army and Navy . . . So can you—and maybe we can help you.

Hospital Field

MODERN HOSPITAL—To get our fighters *fit for duty GAS* cooking plays its roll for Victory!

Technical SECTION

HAROLD L. GAIDRY, *Chairman*
J. H. WOLFE, *Vice-Chairman*
A. GORDON KING, *Secretary*

Servicing Treatment for the Preservation of Motor Vehicles in Storage*

Contributed by Committee on Operation of Public Utility Motor Vehicles

JEAN Y. RAY, *Chairman*

1. General, Types of Treatments for Various Conditions

1.01 Where it is known that a gasoline engined motor vehicle will be laid up for a period of time, it should be given a servicing treatment at the beginning of the layup period to prevent rusting or other deterioration. The length of layup time which will make it necessary to apply special servicing treatment to the vehicle, depends upon the atmospheric and storage conditions.

There are three types of treatments. The one to be used depends upon the conditions of storage and the expected length of time in storage.

1.02 *The partial engine and fuel system treatment* consisting of approved RUST INHIBITING OIL poured into the gasoline tank should be given to vehicles which will be laid up under ordinary conditions from 1 to 2 months, and for vehicles which under severe conditions will be laid up from 2 weeks to 1 month. It is expected that "ordinary conditions" (1.05) will cover all but a small per cent of special cases where "severe conditions" as defined under 1.06 will be encountered.

1.03 *The complete engine and fuel system treatment* includes the same as in 1.02 plus additional engine protection, and should be given to vehicles which will be laid up from 1 to 2 months under severe conditions.

1.04 *The complete vehicle treatment* includes 1.03, together with protection of other parts of the vehicle, and should be given to vehicles which will be laid up longer than 2 months under any conditions.

1.05 "Ordinary Conditions" of layup would be where the vehicle would be stored in a fairly dry place, away from salt air, subject to only small and infrequent changes in temperature. Under any condition vehicle should be stored where it would be protected from direct sunlight. The darker, cooler and drier the storage the better.

1.06 "Severe Conditions" of layup would be where the vehicle would be stored in a damp place, or where the temperature changes would be frequent and sufficiently severe to condense moisture from the air upon the metal, or especially in sea coast locations with prevailing winds off the water.

1.07 Chart showing types of treatment for various conditions and lengths of time.

Atmospheric and Storage Conditions	*Expected Length of Lay-up*		
	2 Wks. to 1 Mo.	*1 Mo. to 2 Mos.*	*Longer Than 2 Mos.*
Ordinary conditions	PEF	PEF	CV
Severe conditions	PEF	CEF	CV

Key: PEF—Partial engine and fuel system treatment.
CEF—Complete engine and fuel system treatment.
CV —Complete vehicle treatment.

1.08 Important features of the servicing treatment are to protect steel surfaces, particularly in and on the engine, from rusting, to protect the tires, and to preserve the battery.

1.09 If the original estimate of the length of time for a vehicle in storage is later found to be materially shorter than will actually be the case, the vehicle should immediately be put on treatment basis corresponding to the latest information.

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2. Partial Engine and Fuel System Treatment

2.01 When the vehicle has only 50 to 100 miles to run before being removed from service, add approved Rust Inhibiting Oil to the gasoline which will be used, in proportion of one quart oil to five gallons gasoline. Care should be taken that the oil does not settle to the bottom without mixing with the gasoline. It will remain in suspension after once being mixed. In any vehicles where the oil is poured in and then gasoline added, the liquids should mix readily. In the lighter vehicles, the mixing will be satisfactory if the oil is added to a partly filled tank of gasoline and the car is rocked by hand. If the oil is to be added to a tank already containing gasoline and the car cannot be rocked to mix the liquids, the oil should first be mixed with approximately an equal amount of gasoline and the mixture poured into the tank. Driving the last 50 to 100 miles with the Rust Inhibiting Oil in the gasoline will leave a protecting film on the inside of the tank, in the metal tubing and on the valves.

3. Complete Engine and Fuel System Treatment

3.01 Complete Engine and Fuel System Treatment includes: Parts 2, 3 and 4. It is important in this treatment that Rust Inhibiting Oil be applied in the gasoline (Item 2.01), and the vehicle then be driven 50 to 100 miles before laying up the vehicle and before remainder of Complete Engine and Fuel System Treatment is given.

3.02 When ready to lay up the vehicle, drain the engine oil and refill crankcase with

* Two more recommended storage practices not covered in this article are as follows: A small piece of cardboard should be inserted under each windshield wiper blade to keep the rubber from sticking to the glass. Rubber gaskets around doors, windows, front ventilator and rear deck should be treated with a rubber lubricant such as DuPont Orel to prevent the rubber from sticking to glass and metal. If the vehicle remains in storage for any length of time and this precaution is not taken, the rubber will pull off when the vehicle is put back in service.

one half a charge of oil using approved Rust Inhibiting Oil. Run engine 5 minutes at idle speed of about 1,000 r.p.m. Leave this oil in engine.

3.03 Remove spark plugs. Turn engine by hand and when each piston is on the power stroke, stop and pour about 2 ounces of approved Rust Inhibiting Oil in the corresponding spark plug hole. At time of pouring oil in spark plug holes, temperature of engine and oil should be above 60 degrees Fahrenheit. Turn engine over twice after treating all cylinders. Replace spark plugs and turn over engine 4 or 5 times with starter.

It is required that piston be on power stroke when oil is added to a cylinder so that both valves will be closed and piston on down stroke. This insures thorough wetting of cylinder wall and rings.

To determine when piston is on power stroke, lay spark plugs on top of engine having them connected to ignition wires and when a plug sparks, the corresponding piston is starting its power stroke.

Turning the engine should be done in most convenient manner: hand cranking, pushing car by hand while having transmission in high gear, jacking up one rear wheel and turning it by hand with transmission in high gear, or turning fan. Care should be taken to keep fingers from under fan belt near pulley.

3.04 The following is an alternative method of applying the Rust Inhibiting Oil to the engine and may be used instead of method given in 3.03. It should be used only if for some reason it is not convenient to follow instructions in 3.03, because of disadvantages in this method (3.04) that: it cannot be used indoors because of volume of smoke, it requires moving vehicle after treatment from out-of-doors to storage location without using its own power, this treatment tends to carbonize engine before storage, and the oil tends to go principally to the middle cylinders thus insufficiently treating the end ones.

The alternative method is as follows: Run engine at about 1,000 r.p.m. and pour through carburetor air intake or pull in through a suction connection to intake manifold about one pint of Rust Inhibiting Oil. The temperature of the engine and oil should each be above 60 degrees Fahrenheit. The oil should be applied as fast as engine will take it without stalling. Heavy oil smoke should come out of exhaust pipe. Just as admission of oil is completed, turn off ignition. Pull throttle wide open and turn over engine 4 or 5 times with starter, having ignition off, to exhaust burnt gases from engine.

3.05 Drain radiator and engine block. If they carry anti-freeze, store it for future use. Leave all drain plugs open. Any loose drain plugs removed should be tied near their location. It is assumed that cooling water carried rust inhibitor which would protect the insides of the cooling jackets from rusting due to any moisture left in draining. If inside surfaces of cooling system are dirty, they should be flushed

Jean Y. Ray (right) and Linn Edsall, chairman and vice-chairman, respectively, of the Committee on Operation of Public Utility Motor Vehicles

to remove deposit so that it will not dry and form scale.

3.06 Clean and service air cleaner.

3.07 Check type of engine oil filter. If filter element is of the can type or if filter is of the sealed type with non-replaceable element, do not disturb it. If filter element is of the replaceable cotton sack type, remove it and replace cap on top of filter case. This will prevent replaceable filter sack from sticking to side walls of case thus making it difficult to remove later at end of storage period.

3.08 Drain gasoline tank, sediment bowl, lines and carburetor.

3.09 Place a "CAUTION" tag on steering wheel stating that vehicle has been given Complete Engine and Fuel System Treatment. Also give date of treatment. Enter on tag a note of any subsequent treatment and date. A note and the date should be entered on card if Complete Vehicle Treatment is given.

4. Sealing Engine

4.01 Remove engine oil filter tube cover and crankcase breather cover if there is one and seal the openings.

4.02 Also seal the air cleaner, tail pipe, and any other openings into the engine. Tubes or pipes can be sealed satisfactorily by covering with a small piece of oil or waxed paper, gathering the edges of the paper around the tube and tying them with a cord. The air cleaner can be sealed conveniently by covering with a paper bag and tying a cord around it at the solid part on the engine side of the air intake openings.

4.03 Sealing the engine to a large extent prevents air moisture from entering the engine.

5. Complete Vehicle Treatment

5.01 Complete Vehicle Treatment includes all parts of this practice except 12 and 13. It is important in this treatment that Rust Inhibiting Oil application in the gasoline (Part 2), Washing (Part 6) and Chassis Lubrication (Part 7) are completed first and that vehicle be driven 50 to 100 miles before remainder of complete treatment is given.

6. Washing

6.01 A few days before the car is to be laid up, wash the entire vehicle, particularly the chassis and engine to remove all incrustations of mud which might hold dampness to rust the metal. The washing should be done sufficiently in advance of laying up the vehicle to permit the brake drums and shoes to thoroughly dry in service so they will be less likely to rust.

7. Chassis Lubrication

7.01 Immediately after the last washing, grease all chassis points to drive out any water in the bearings.

7.02 Unless these lubricants have been changed very recently; repack grease in front wheel bearings, on construction trucks change lubricant in the winch worm gear case and in the propeller shaft power take off case, change transmission and rear axle lubricant, and change lubricant in universal joints if they are not of the permanently sealed type.

8. Brakes, Clutch

8.01 Release all brakes. Brake shoes may have a tendency to stick to drums if left engaged for long periods of time.

8.02 Depress clutch pedal and place small block of wood between clutch pedal arm and under side of floor board to hold clutch out of engagement. This block should not be any larger than necessary to make sure that clutch faces are separated. This prevents clutch lining from sticking to clutch plate.

9. Trim, Upholstery, Windows, Bright or Exposed Metal, Sealing Body or Cab

9.01 Spray all woolen upholstery with moth prevention liquid of a type which will not damage it, or place moth exterminating preparation such as paradichlorobenzene crystals in car just before it is closed for storage.

9.02 Cover upholstery with clean paper.

9.03 Close all windows to keep out dust, moths, etc.

9.04 Cover all bright, unpainted and exposed metal on the entire vehicle except inside body or cab, with a thin coating of approved RUST INHIBITING GREASE: bumpers, grilles, hub caps, handles, etc. Do not get grease on the paint finish.

9.05 Screen up any openings in floor boards to prevent mice from entering interior of body or cab.

9.06 Make sure that all rubber floor mats are lying in normal position on floor. (Not rolled or curled up.)

9.07 If storage space is such that finish on tops of vehicles may be damaged by bird droppings or other injurious dirt, cover with paper. Use craft-paper or some other non-sulphite process paper so as not to damage finish by slight chemical action.

9.08 Unless absolutely necessary, vehicles should not be stored where subjected to direct sunlight because of deteriorating

effect on tires, other rubber parts, finish and upholstery. If stored under such condition cover windshield and windows with dark paper and masking tape.

9.09 Any vehicles with cloth or fabric tops should be stored with the tops up and cloth free from wrinkles, but preferably not tight. If necessary to cover top with paper or cloth to protect it, use material which will not stain the top.

10. Battery

Remove battery to charging rack. Clean battery connections and wipe with light grease.

10.02 In case it is necessary to leave battery in vehicle because of inaccessibility of any charging rack, the battery should be fully charged and serviced with water at beginning of storage period.

11. Tires

11.01 Block up vehicle in storage location taking weight off the tires, maintaining vehicle in such condition that it is always ready for immediate service when required.

11.02 Inspect tires for nails and grease patches. Remove any nails and wash off any grease patches with solvent cleaner such as Varsol, or Varnolene. Wipe dry.

11.03 Keep tires away from direct sun heat, registers or radiators as heat deteriorates them. If it is necessary that they be subjected to direct sunlight, cover tires with opaque paper held by masking tape.

11.04 Thoroughout time car is laid up, maintain air in tires, including spare, between ⅓ and ⅔ operating pressure so that vehicles can be *pushed or towed out* quickly if necessary in an emergency. Tension in cords will be relieved by the lowered pressure.

11.05 In case conditions make it necessary to store vehicle in a hot place, as for instance a hot loft, remove wheels including spare and store them with their tires in a dry cool place. Maintain their air between ⅓ and ⅔ normal pressure, and store them in a horizontal position with not more than 6 in a pile.

12. Attention to Vehicle During Storage

12.01 The battery whether on a charging rack or in the vehicle should be recharged at intervals of about two months or sufficiently often to prevent the hydrometer reading of the electrolyte from dropping below about 1,200.

12.02 As outlined under Paragraph 11.04, air in the tires, including spare, should be replenished often enough to keep the air between ⅓ and ⅔ operating pressure.

12.03 *At six month intervals* in storage, service engine with Rust Inhibiting Oil and gears as indicated in 12.03-12.06. Remove all spark plugs. Remove engine seals, see Part 4.

Connect a fully charged battery to engine and crank over the engine with starter until oil gauge shows at least 5 pounds pressure. This should require not to exceed 15 seconds. If pressure is not up in 15 seconds, wait two or three minutes and repeat cranking operation.

12.04 Turn both rear wheels in same direction at same time by hand 2 revolutions to coat gears in axle and transmission with oil. In case wheels have been removed turn by gripping rear brake drums. An alternative method is to remove block from clutch pedal, put transmission in high gear and crank over 12 to 15 times with starter, then replace block under clutch pedal arm.

12.05 Pour two ounces of approved Rust Inhibiting Oil into each cylinder when corresponding piston is on power stroke, see Paragraph 3.03. Turn over engine twice by hand.

12.06 Remove battery if it is being stored on charging rack. Replace engine seals and spark plugs.

13. Preparing Stored Vehicle for Service

13.01 Close cooling system drains and fill with water, adding rust inhibitor, and adding anti-freeze if required.

13.02 Place fully charged battery in vehicle, clean battery terminals and cable terminals and connect.

13.03 At least partially fill gasoline tank.

13.04 Drain Rust Inhibiting Oil from engine.

13.05 Service engine oil filter. If filter is of sealed type replace it with new one. If filter is of replaceable element type, remove old element in case there is one, clean out case and install new element.

13.06 Fill crankcase to indicated level with regular engine oil.

13.07 Check oil level in all gear cases: transmission, differential, power take-off and winch.

13.08 Remove paper from outside of vehicle and from tires.

13.09 Clean Inhibitor Grease from parts where it has been applied, by using a rag moistened with kerosene.

13.10 Replace wheels with their tires on the vehicle in case they have been removed. Inflate tires to operating pressure and then remove blocks from under front and rear ends so vehicle will rest on tires.

13.11 Remove paper from upholstery and clean inside and outside of vehicle.

13.12 If vehicle has been laid up more than nine months, remove hub caps and check condition of lubricant in wheel bearings to see whether it has hardened. If it is not thoroughly soft, remove wheels and repack bearings with new lubricant.

13.13 Tow vehicle out into open before starting engine because of heavy smoke which will exhaust for a few minutes after starting. Remove block from under clutch pedal arm.

13.14 Inspect distributor, paying particular attention to the points, and see that it is in good condition. Clean distributor cap. Clean and adjust spark plugs. Prime each cylinder with one teaspoonful of gasoline through spark plug holes. Properly tighten spark plugs in place and connect wires. Try starting engine. If engine does not start by third attempt, make sure gasoline pump is working.

13.15 With engine running inspect water connections, oil connections and gasoline connections particularly near synthetic rubber sections, for leaks.

13.16 Check all lights, turning signals, brakes, horn and windshield wiper.

13.17 Drive vehicle a few blocks to make sure it is functioning satisfactorily before returning it to regular service. While driving be sure to check action of service and parking brakes.

· · · CHEMICAL WRINKLE · · ·

PREPARATION OF CHROMOUS CHLORIDE SOLUTION FOR DETERMINATION OF OXYGEN IN GAS

By ARTHUR E. SANDS*

Research Department, Koppers Co., Kearny, N. J.

THE chromous chloride is prepared by reduction of chromic chloride solution in a Jones reductor. To prepare the reductor, dissolve about 5 gm. of mercury in about 50 cc 1-1 HNO_3. When dissolved, dilute to 250 cc and pour into a liter flask. Add 500 gm. of 20 mesh zinc, shake for several minutes, allow to stand for ten minutes, and wash with water by decantation.

Place a few small pieces of broken porcelain or glass in the bottom of the Jones reductor, follow this with a layer of glass beads. On the glass beads place a layer of glass wool, then a layer of asbestos, and on top another layer of glass wool. *It is extremely important that the filter bed be carefully prepared so as to prevent minute particles of the zinc amalgam from being carried through with the solution.* If this happens, a slow evolution of hydrogen from the solution will result. A good solid filter bed is desired—without being packed so tight as to prevent flow of solution.

Dissolve one pound of Baker's C.P. chromic chloride in a mixture of 60 cc of concentrated HCl and 1150 cc H_2O. Heat to 60° C. and pour through the reductor collecting the chromous chloride solution in a bottle of suitable size equipped with a stopper bearing two tubes—one of which extends to the bottom of the bottle, the other passing just through the stopper. The solution will, of course, be taken into the

* Chairman, Subcommittee on Wrinkles, A. G. A. Chemical Committee.

bottle through the long tubing connection, with the other connection serving as a vent. The vent should have a rubber tubing connection dipping slightly below the surface of water in a beaker to serve as a seal. The bottle should previously be purged with nitrogen or other suitable inert gas to remove air.

The rate of solution flow through the reductor will probably be limited by the resistance of the packing, but in any case should be slow enough to insure complete reduction. This is evidenced by the characteristic blue color. If the color tends towards a green shade, reduction is incomplete.

The solution being added to the reductor should be kept at 55-60° C. It will be necessary to keep a thermometer in the beaker and add heat occasionally. If the temperature becomes too low, the rate of reduction is retarded. If heated much above 60° C., the zinc amalgam will be consumed too rapidly.

The chromous chloride should be kept under a moderate pressure of inert gas to prevent air leaking into the bottle. Pipettes (previously purged with inert gas) are conveniently filled by connecting to the storage bottle and displacing solution from the bottle with the aid of inert gas. The inert gas may be nitrogen, hydrogen, or coke-oven gas.

This solution is substantially the same as a solution for oxygen absorption sold by a laboratory supply house. The writer has found, however, that the commercial solution frequently gives off small amounts of hydrogen—sometimes for a long period. Chromous chloride solution prepared according to these directions will not give off hydrogen, will remove all of the oxygen from 100 cc of air in two passes into a bubbling pipette, and does not absorb any of the usual components of gas other than oxygen. Gases which are readily soluble in aqueous solutions should, of course, be previously removed.

After use, the Jones reductor should be thoroughly washed. This may be done conveniently by attaching a siphon from a large bottle of distilled water to the tube on the bottom of the reductor and allowing the water to overflow from the top into a sink. Prevent the reductor from becoming dry by keeping covered with water when not in use.

GAS BURNER PORT STUDY

(Continued from page 258)

tiple rows of ports have the same effect on flame heights as closer port spacing. It will also be noted that the outer mantle height of the flames on the two rows of ports is twice that of those on a single row of ports. This influence was also illustrated previously in Fig. 5, under yellow tip conditions.

For each port size up to and including No. 26 D.M.S. a straight line relationship applied as outer mantle heights were found to be directly proportional to port size and gas rate per unit of port area. As shown by Fig. 8, outer mantle heights appear to be independent of primary aeration. The left and right sides of this photograph were taken in separate exposures at the same gas rate but with a high percentage of primary air on the left half and with a low percentage on the right. Under these conditions the outer mantle heights are equal. However, as port size is increased to ¼ and ½ inch diameters, other factors become applicable and primary air exerts a marked influence on outer mantle height so that a straight line relationship no longer holds.

Combustion Space Requirements

From the standpoint of combustion space requirements in an appliance, particularly head room above the burner, perhaps one of the most interesting observations made in the course of these studies is that port size does not affect inner cone height. This is illustrated in Fig. 9 where, by means of a double exposure on the same photographic plate, two different port sizes are shown. Those on the right are No. 26 D.M.S. ports while on the left are No. 36 D.M.S. ports. In making this photograph the same gas input per port and percentage primary air were supplied. It may thus be readily seen that inner cone height remains unchanged.

In analyzing these data mathematical formulae for calculating inner cone and outer mantle flame height and lifting limits with normal variation in port size, depth, and spacing, were developed which from the standpoint of applying this information will be valuable.

A modification in the equation for determining flow of air-gas mixture through burner ports was also suggested and supported by experimental data. Although flow of gases through an orifice or port has in previous studies been considered to follow an equation developed in Technical Paper No. 193 of the National Bureau of Standards, it was shown that this formula required revision to agree with factual data. Formulae for gaseous flow are complex and several factors which have been omitted in mathematical equations previously used for calculating port discharge coefficients must be taken into consideration. While the coefficient of discharge developed and employed to date varies directly with the total flow of gas, that just developed by the Laboratories is practically constant for the range of port sizes normally employed.

This investigation has been so productive of new and valuable data and relationships on burner design that it is believed similar detailed studies should be carried out on burner head shape and internal baffling, mixing tube design and primary air control. With full information along these lines available, the science of burner design could be advanced to the point where more accurate mathematical calculations could be made and burner performance predicted with far greater certainty than is now possible. Employing fundamental data thus obtained, it is believed that present types of burners could be greatly improved and entirely new designs perfected. Among interesting subjects for additional research would be development of principles covering design of

1. Atmospheric burners capable of injecting all air necessary for combustion as primary air.
2. Small tubular burners with combustion taking place inside the tube.
3. Burners utilizing no primary air but operating with short blue flames.
4. Luminous flame burners.

From preliminary results already obtained, developments of this nature seem readily within the reach of our industry.

It will be apparent from the foregoing that important and valuable information is provided which, taken with those studies already published in bulletin form, present the most comprehensive source of technical knowledge on domestic gas appliance design and operation now available. Its practical application, together with that resulting from other projects also being sponsored by the Committee on Domestic Gas Research, will undoubtedly be reflected in far-reaching improvements in domestic gas appliances.

Laboratories

GEORGE E. WHITWELL, *Chairman*
R. M. CONNER, *Director*
W. H. VOGAN, *Supervisor, Pacific Coast Branch*

Laboratories Engineers in the Armed Forces

BRINGING the number of former A. G. A. Testing Laboratories' engineers now serving in the armed forces to a total of 18, Carl F. Geltz and Norman F. Schulz were recently inducted. Mr. Geltz, who for the past several months has been acting as Assistant Chief Inspector at the Cleveland Laboratories, resigned on May 12. He joined the staff in January, 1939. Mr. Schulz joined the Laboratories in March, 1941.

Two former Laboratories' engineers, Walter J. Gay and Frank J. Pryatel, were recently promoted to the rank of ensign in the Navy, Mr. Gay enlisted the first of this year and was stationed at Annapolis where he successfully completed the V-7 course given to graduate engineers to qualify for his new rank. Mr. Pryatel was commissioned after 6 months preliminary training in naval ordnance in Philadelphia where he was primarily engaged in adjustment and repair of special instruments and apparatus. During the course of this brief assignment, he was recipient of the coveted Navy "E" for meritorious industrial achievement.

Domestic Gas Range Research Broadened

ACCORDING to an announcement by R. L. Fletcher, Chairman, Committee on Domestic Gas Research, American Gas Association, the name of Project No. 1 "Research in Domestic Gas Ranges" has been changed to "Research in Domestic Gas Cooking." This change has been made in order to describe more completely the research work being done under this project, which work includes a number of cooking investigations not directly connected with ranges as such.

The project "Research in Domestic Gas Cooking" is the key project of the extensive domestic gas research program that has been authorized by the Executive Board of the Association. Other projects in the program on which work has been under way for some time are Project No. 2 "Domestic Gas Water Heating Research," Project No. 3 "Research in Fundamentals of Atmospheric Gas Burner Design," Project No. 5 "Research in Direct Gas Space Heating" and Project No. 6 "Research in Central Gas Space Heating." With conditions during the post-war period in mind, plans for still further expanding the program are being formulated.

A number of valuable technical bulletins have been released as a result of these projects which are being conducted in the Association's Laboratories in Cleveland. Technical and engineering material contained in these bulletins has been carefully checked by Technical Advisory Committees of Manufacturers before being printed. The latest bulletin entitled "Fundamentals of Design of Atmospheric Gas Burner Ports" reports on one phase of Project No. 3. It will be off the press shortly. Copies of Domestic Gas Research Bulletins can be secured from A. G. A. Headquarters.

Manufacturers Honor W. H. Vogan

W. H. Vogan

IN recognition of the efficiency with which W. H. Vogan has administered the affairs of the Pacific Coast Branch of the American Gas Association Testing Laboratories, the following resolution was presented and unanimously adopted at the May 27, 1942 meeting of the Executive Committee, Manufacturers' Section of the Pacific Gas Association:

"WHEREAS, for the past three years, W. H. Vogan has served the gas industry as Supervisor of the Pacific Coast Branch of the American Gas Association Testing Laboratories, and

WHEREAS, the war emergency now makes it necessary that he transfer his field of activity to the main Testing Laboratory in Cleveland,

THEREFORE BE IT RESOLVED, that the thanks and appreciation of the Manufacturers' Section of the Pacific Coast Gas Association be extended to Mr. Vogan for the impartial and efficient manner in which he has administered the affairs of the Laboratory in the interests of both the appliance manufacturers and the gas utility companies,

AND BE IT FURTHER RESOLVED, that the Manufacturers' Section expresses the sincere hope of its members that Mr. Vogan's absence from the Laboratory at Los Angeles may be for the duration only, and that he may be again located on the Pacific Coast when the present emergency is over."

Employed by the Testing Laboratories in August, 1928, Mr. Vogan has participated in all branches of their activities. As Chief Inspector at the Cleveland Laboratories for several years he was widely acquainted with gas appliance manufacturers through frequent inspection visits to their factories. In April, 1939 he was appointed Supervisor of the Pacific Coast Branch. During his administration, the new Laboratories' building in Los Angeles was erected and dedicated. In this period the volume of operations at these Laboratories reached the highest point in their history. During his absence, F. A. Allen, assistant supervisor, will assume charge.

Mr. Vogan's return to the Cleveland Laboratories was necessitated by their increasing war activities. He will be associated with W. R. Teller, Chief Engineer of the War Products Department.

New War Standards for Ranges

PREPARED at the request of the War Production Board, American Emergency Standard Approval Requirements for Domestic Gas Ranges were recently published and distributed to interested manufacturers. Formulated for the purpose of reducing amounts of strategic materials used in range construction to a minimum, these streamlined standards will remain in effect for duration of the emergency. They cover the so-called "cooker" type range embodying separate oven and broiler, using a common burner, for both federal housing and civilian needs.

Major changes from the current range standards cover constructional features. A reduction of 2 gage sizes from the present required thickness of sheet metal parts is permitted. Other changes include elimination of utility drawers, top burner covers and one of the two oven racks formerly supplied. All applicable standards for safety, performance, and efficiency remain unaltered. In view of the differences in materials employed, certified models must bear the following permanently attached statement in addition to the Laboratories Approval Seal: "Approved under War Emergency Requirements."

Additional information as well as copies of these requirements may be obtained from the American Gas Association Testing Laboratories, Cleveland, Ohio, and Los Angeles, California.

HOME SERVICE ACTIVITIES

(Continued from page 279)

called the "Victory Lunch" and no other menu on the card was so listed or marked.

The company has now set up a nutrition center on the sales floor along the lines of the Home Volunteer Program and cooperation in taking care of this nutrition center is being given by the Girl Scouts.

Illinois Northern Utilities Co., Dixon, Ill., Miss Josephine Killeen, Home Service Director.

Each of the six members of the home service department are conducting special nutrition lectures. They give these lectures before different groups in the city such as the luncheon clubs, mothers' clubs, scout classes, and adapt them also to the other clubs according to their programs. Special booklets with red, white and blue covers are entitled "War Budget Canning." Two others are on "Defense Budget Cooking," one dealing with meat cookery and the other meal planning and a guide for buying, storing and cooking of foods to meet the nutrition schedules. Nutrition booths have been set up in each of the twenty-four offices of this company and to date more than 10,000 booklets have been distributed.

Michigan Consolidated Gas Co., Grand Rapids, Mich., Miss Lucille Hall, Home Service Director.

Over a period of years Miss Hall has conducted a radio program of two broadcasts a week and on the first week in May had completed her 474th broadcast. During this past year Nutrition has been a runner up. An interesting adaptation of advertising has been carried on in this company. A series of advertisements up to twenty at present, have dealt with the modern preparation of food. Clip sheets of the ads set up in booklets 18 x 13 inches entitled "Meals that Build Morale" outline the series. They have been made available upon request to the cooking classes in the schools. The teachers have reported them to be particularly interesting and excellent as a good way to present food information dramatically and pictorially.

Through Grand Rapids the eighteen nutrition courses under way come to the gas company for four of the ten lessons. In this way there is wide coverage. Groups for two canteen courses have received four lectures also at the gas company auditorium, which is particularly adapted to that sort of instruction since it gives women the opportunity to prepare food in quantity. The hundred women in each class prepare their own lunches with the group divided into different units for preparation, serving and cleaning up.

Iowa-Illinois Gas and Electric Co., Rock Island, Ill., Margaret Crooks, Home Service Director.

The local Civilian Defense organization has assigned all nutrition activities to the Red Cross with Mrs. Crooks as Red Cross Nutrition Chairman for lower Rock Island County. With the help of the Tri-City Home Economics people she has organized a series of nutrition classes in Rock Island. Two nutrition centers, one on the Rock Island sales floor of this company and one in Moline have followed the Servel Home Volunteer plan of registration and the following program is carried on: a series of demonstrations for Girl Scouts and industrial women on the subjects of lunch packing, vegetable cookery, canning and meal planning; the bulletin board outlines pertinent news material of nutrition from Civilian Defense; a stationary scrap book contains ready reference material on government, state and utility bulletins; posters, charts and food prepared by High Schools and Girl Scouts is displayed at intervals in the center where formerly this sort of display was carried on in the store windows.

Lack of space prevents the listing of the many other excellently done activities reported at the conference. Some of the additional speakers included Honore O'Brien, Public Service Company of Northern Illinois, Oak Park; Isabel Fallon, Western United Gas and Electric Company, Aurora; Helena Kunkel, Iowa-Illinois Gas and Electric Co., Davenport, Iowa; May McLaughlin, Central Illinois Light Company, Peoria; Veda Curtis, Northern Indiana Public Service Company, Fort Wayne; Mrs. Violet Hollis, Montana-Dakota Utilities Company at Bismarck, N. D., and Mary Shields of the North Shore Gas Co., Winnetka, Ill.

This round-table meeting was voted by many of the group attending as one of the most interesting and helpful meetings ever attended. No doubt this sort of regional meeting will continue in different sections of the country because, with the fast-moving developments today particularly as they effect the work of home service, much can be gained by pooling ideas, illustrative material and subject matter.

Central Illinois Electric and Gas Co., Freeport, Ill., Aileen E. Witmer, Home Service Director.

As Chairman of the Public Relations Committee in the County Nutrition Committee, Miss Witmer reported that Government food charts were placed in the grocery, bakery and meat stores with the recommendation that these charts be moved around the stores, first of all to the milk department for one week, the second week to the fresh vegetables, the third week to the fruit counter, and so on. Then a Nutrition Rally Week throughout the city brought forth posters made by the art departments of the schools and their nutrition reference shelves in the libraries provided a new source of nutrition promotion in the city.

During the Rally Week, special demonstration classes were started in the gas company office for a period of three a week for four weeks. There were many requests received from hotels and restaurants for special assistance in setting up a series of menus entitled "Victory Luncheons." These menus were used in the restaurants and hotel dining rooms and charts of the Nutrition Yardstick were also prominently displayed in the rooms. One lunch item each day was

Personnel Service

SERVICES OFFERED

Salesman with A1 reference and sales ability. Experience in selling gas ranges for 22 years, calling on better dealer and department store. Desires a connection with Metropolitan New York or utility company's sales department. Former position terminated on account of war. **1443.**

Manager, college degree, with more than twenty years' experience in management of manufactured gas properties, both coal and water gas. Familiar with operation in Spanish country. Not particular about location. **1444.**

Engineer, M.E., 15 years' utility experience in all branches of utilization and sales of manufacturing gas, particularly **Industrial Engineering** and **Sales.** Also experience in air conditioning, industrial application of electric heating and private power plant competition. Desire position with a utility, manufacturer or consultant. **1445.**

Engineer—22 years gas and electric plant design, construction, maintenance, and operation. Completed cadet course on coke oven operation, served as chief draftsman for operating company, as Operating Engineer for Gas Construction Company and recently on construction of topping turbines and auxiliaries. Prefer Southeast. (46) **1446.**

Practical gas man thoroughly familiar with all types of gas burning equipment, setting and testing gas meters. Excellent references. Specialist in conversion work. **1447.**

Available for consultation—**Gas Engineer** of 40 years' experience small and medium plants. Designs for adapting to heavy oil and bituminous coal; steam accumulators; tar eliminators; compounding existing station governors; butane-air change-overs; cinder catchers; by-building equipment from scrap pile and own labor costs are greatly reduced. **1448.**

POSITIONS OPEN

Sales Manager for manufactured gas utility with knowledge of directing residential, commercial and industrial sales and promotional activities. **0367.**

Oil-Gas Plant Superintendent for supervision of operation and maintenance of oil-gas plant, having three generators, each 800,000 cu.ft. day capacity. Experience in gas plant operation desirable, not necessarily oil-gas plant. Salary approximately $300 month; location Panama. Vacation two months after two years service plus reasonable traveling time and transportation paid to U. S. and return. Transportation to Panama for man and family. Apply by letter giving fully past experience and salary earned each position also references. **0368.**

Design Engineer, familiar with development work and test procedures on gas-fired central heating and conversion equipment. Must sincerely prefer continued association in this field, as afforded through employment by nationally recognized manufacturer, who desires to further improve his products and fabrication methods. Advise qualifications, draft status, age, and expected salary. **0369.**

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